A SYNOPSIS TO THE INDIAN GENERA OF THE FISHES OF THE FAMILY SCIAENIDAE

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ABSTRACT

Thirty species of sciaenid fishes so far known from India are classified under 14 genera based on the structure of air bladder, otolith and sensory pores. A synoptic key to the subfamilies and genera is given.

INTRODUCTION

Cuvier (1830), Gunther (1860), Bleeker (1874), Day (1878), Fowler (1933), Weber and de Beaufort (1936), Munro (1955) and Yazdani (1956) based their classification of sciaenids on the characters such as the position of mouth, body form, size of second anal spine, dentition and sensory pores on snout and lower jaw. Unfortunately characters which are now considered dependable, such as the nature of the gas bladder, otolith and sensory pores on head, were not taken into account by these authors. Due to the apparent convergence of external morphological characters between the species of different genera, their value is limited. Day (1878) recognised four genera of sciaenid fishes from India, while Cuvier (1830), Günther (1860) and Bleeker (1874) recognised five genera, Fowler (1933), and Weber and de Beaufort (1936) six genera, Munro (1955) three genera, and Chu, Lo and Wu (1963) eight genera. In the present study 14 genera are recognised embracing the known thirty species of sciaenid fishes from India.

Trewavas (1962) while studying the sciaenid fishes of the west coast of Africa drew attention to the importance of gas bladder and otoliths in the taxonomy of these fishes. Chu, Lo and Wu (1963) classified the sciaenids of China and adjacent areas based on the characters such as structure of gas bladder, otolith, sensory pores on snout, lower jaw and dentition. However, as pointed out by Trewavas (1963), their conclusions suffer from drawbacks on account of the lack of comparative material from the Indian region. Trewavas and Yazdani (1965) created the genus *Chrysochir* to accommodate *Otolithus aureus* Richardson. Mohan (1969) erected three genera to accommodate three species that were formerly placed in different inappropriate genera. Talwar and Joglekar (1970) created a new genus *Dhoma* which is a junior synonym of *Kathala* Mohan, 1969.

Dutt and Thankam (1968) partially adopted the classification based on the gas bladder. They have confused the sciaenid fishes *Chrysochir aureus* (Richardson) with *Otolithoides brunneus* (Day) as the structure of the gas bladder they described as belonging to *S. brunneus* Day is in fact that of *Chrysochir aureus* (Richardson), a species not mentioned by Day (1878). They have also ascribed the presence of vertical bands to *Pennahia aneus* (Bloch). But adult specimens of *P. aneus* do not have bands though fingerlings (25 mm to 50 mm length) of many species of sciaenid fishes, including *Pennahia aneus*, have vertical bands. Sinha and Rao (1969) described a new species *Dendrophysa hooghliensis*. This species seems to be a junior synonym of *Nibea albida* (Cuvier).

Trewavas (1961) recognised five tribes, Pseudotolithini, Otolithini, Cynoscioni, Sciaenii and Umbrinini among the sciaenid fishes of the west coast of Africa. Chu, Lo and Wu (1962), in the monograph on the sciaenid fishes of China, classified the family Sciaenidae with seven subfamilies, Johniinae, Megalonibinae, Bahabinae, Sciaeninae, Pseudosciaeninae, Argyrosominae and Otolithinae. Due to the structure of sagitta and air bladder a subfamily rank has to be given to certain taxonomic groups, and certain categories have to be relegated to the rank of tribes. In the present state of knowledge the Indian sciaenid fishes can be placed in five subfamilies—Johniinae, Kathalinae, Sciaeninae, Otolithoidinae and Otolithinae. The subfamilies Otolithoidinae and Otolithinae are further divided into two tribes each, Macrospinosini and Otolithoidini, and Otolithini and Argyrosomini, respectively.

Family : Sciaenidae
Subfamily : Johniinae
Johnius Bloch
Johnieops gen. nov.
Subfamily : Sciaeninae
Umbrina Cuvier
Subfamily : Kathalinae
Kathala Mohan
Subfamily : Otolithoidinae
Tribe : Macrospinosini
Macrospinosa Mohan
Tribe : Otolithoidini
Otolithoides Fowler
Panna Mohan
Subfamily : Otolithinae
Tribe : Otolithini
Otolithes Oken
Pennahia Fowler
Tribe : Argyrosomini
Atrobucca Chu, Lo and Wu
Argyrosomus de la Pylaie
Dendrophysa Trewavas
Nibea Jordon and Thompson
Chrysochir Trewavas and Yazdani

SYNOPSIS OF THE SUBFAMILIES OF THE FISHES OF THE FAMILY SCIAENIDAE OF INDIA

1. a. Gas bladder with more than 14-15 pairs of arborescent tubules; mental pores 5 - 6 2

   b. Gas bladder with less than 3 pairs of arborescent tubules; mental pores 2 - 4 3

2. a. Gas bladder with anterior lateral outpushings .....Johniinae

   b. Gas bladder without anterior lateral outpushings .....Otolithinae

3. a. Gas bladder with one or two tubules 4

   b. Gas bladder with no tubules.....Sciaenidae

4. a. Sagitta *Otolithes* type .....Otolithoidinae

   b. Sagitta *Johnius* type .....Kathalinae

Genus 1. **Johnius** Bloch

Johnius Bloch, 1793, *Natur. Ausland. Fish.*, pt. 7: 132.

(Genotype: *Johnius carutta* Bloch, 1793, type locality: Tranquebar, India); Bleeker. *Natuurk. verh. Koninkl. akad.*, **14** : 58-59, 1874; Fowler, *Bull. U.S. nat. Mus.*, **100, 12:** 370-371, 1933; Weber and de Beaufort, *Fish. Indo-Aust. Archipel.*, **7:** 526, 1936; Collignon, *Bull. Inst. Oceanogr. Monaco*, No. 1155: 7-8, 1959; Trewavas, *Ann. Mag. nat. Hist.*, (13) **5**: 173, 1962; Chu, Lo and Wu, *Monogr. Fish. China:* 19-20, 1963; Yazdani, *J. zool. Soc. India*, **15:** 65, 1963 (1966); Dutt and Thankam, *J. Bombay nat. Hist. Soc.*, **65** (2): 36-39, 1968.

Wak Lin, 1938, *Lingnan Sci. J.*, **17**, 3: 378 (Genotype: *Bola coiter* Hamilton, 1822, type locality: River Ganges); Chu, Lo and Wu, *Monogr. Fish. China:* 27, 1963.

Bola Hamilton, 1822, *Fish. Ganges:* 78 (Genotype: *Bola coiter* Hamilton, 1822, type locality: River Ganges); Jordan and Stark, *Ann. Carneg. Mus.*, **11:** 451-452, 1917.

Gas bladder with anterior lateral outward projection; lateral arborescent tubules present. First branch divides into two, one extending to head and other to exterior through the branchial wall; arborescent tubules thick and 15 to 18 (Fig. 1A); otolith (sagitta) enlarged anteriorly with a projection and posteriorly pointed; anterior inner lateral depression not deep, marginal groove shallow but posteriorly forms a deep pit. The posterior end curved, outer lateral side elevated (Fig. 2A); three rostral pores on snout; five marginal pores at the free margin of snout, median marginal pore on the median lobe, inner and outer pores deep; lower jaw with five mental pores, median mental pore distinct with a fleshy pad around it and an inner and outer mental pore on each side; mouth inferior, horizontal; snout overhangs lower jaw; teeth differentiated in upper jaw and not so in lower jaw; a median barbel may or may not be present. D.IX-X, 1, 22-34.

Species from India

1. *Johnius carutta* Bloch, 1793. (Genotype): coasts of India, Sumatra, Southern China.

2. *Johnius belengerii* (Cuvier, 1830). (= *Corvina belengerii* Cuvier, 1830); Natal, coasts of India, Malay Peninsula, East Indies and Philippines.

3. *Johnius dussumieri* (Valenciennes, 1833). (= *Umbrina dussumieri* Valenciennes, 1833); Madagascar, coasts of India, Singapore, East Indies, Southern China.

4. *Johnius macropterus* (Bleeker, 1853). (= *Umbrina macropterus* Bleeker, 1853); coast of Natal, India, East Indies.

5. *Johnius osseus* (Day, 1878). (= *Sciaena ossea* Day, 1878); coasts of India.

6. *Johnius glaucus* (Day, 1876). (= *Sciaena glaucus* Day, 1878); coasts of India.

7. *Johnius coiter* (Hamilton, 1822). (= *Bola coiter* Hamilton, 1822); India, Burma, Indo-China, China.

Remarks: The genus *Wak* Lin (1938) is not recognised, as its genotype *Bola coiter* Hamilton is a species of *Johnius*.

Genus 2. **Johnieops** gen. nov.

Type species: *Sciaena osseus* Day, 1876. Type locality: Malabar coast.

Air bladder with anterior laterial outpushings, lateral arborescent tubules present, 15-20, first branch on each side divides into two, one extends to head and other to exterior through the branchial cavity; posterior end tapering and extending to base of anal fin; otolith enlarged anteriorly with a forward elongation, anterior inner lateral depression shallow, marginal groove as a pit posteriorly; outer lateral side elevated (Fig. 2B); snout with three rostral pores, five marginal pores, the free margin of the snout not indented deeply; lower jaw with five mental pores, median pore crescentic and an inner and an outer mental pore on each side; no fleshy pads between the pores; mouth oblique or horizontal; upper jaw may or may not overhang lower jaw, teeth differentiated in upper and lower jaws with an inner row of villiform teeth; no mental barbels. D.X, 1, 27 - 31.

Species from India

1. *Johnieops sina* Cuvier, 1830. (=*Corvina sina*, Cuvier, 1830). Coast of India, China seas.

2. *Johnieops vogleri* (Bleeker, 1853). (=*Otolithus vogleri* Bleeker, 1853): India, East Indies.

3. *Johnieops bleekeri* (Day, 1878). (=*Sciaena bleekeri* Day, 1878). India.

4. *Johnieops osseus* (Day, 1878). (= *Sciaena ossea* Day, 1878). India.

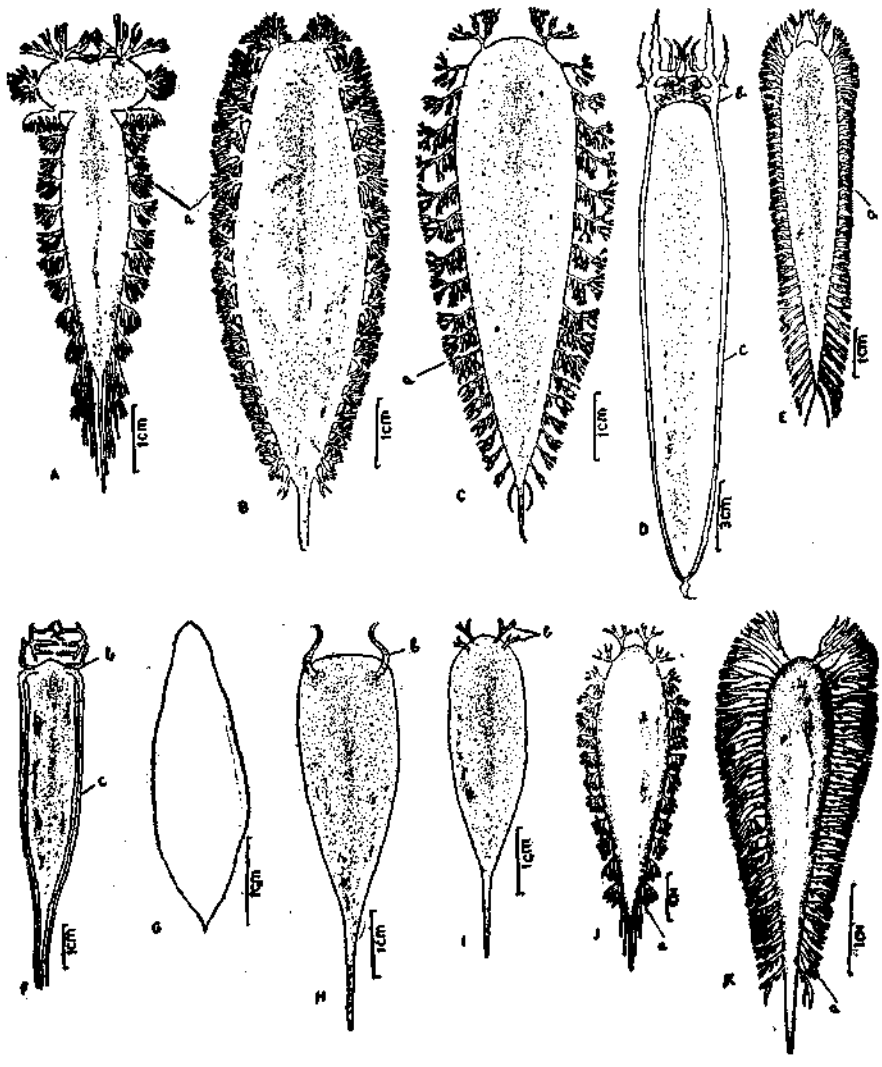

Fig. 1. A. Air bladder of *Johnius carutta* (Bloch) Total length 212 mm; B. Air bladder of *Nibea diacanthus* (Lacepede) T.L. 228 mm; C. Air bladder of *Pennahia aneus* (Bloch) T. L. 182 mm; D. Air bladder of *Otolithoides biauritus* (Cantor) T.L. 532 mm; E. Air bladder of *Otolithes ruber* (Bloch and Schneider) T.L. 190mm; F. Air bladder of *Panna microdon* (Bleeker) T.L. 200 mm; G. Air bladder of *Umbrina sinuata* Day (After Trewavas, 1964: 108); H. Air bladder of *Kathala axillaris* (Cuvier) T.L. 102 mm; I. Air bladder of *Macrospinosa cuja* (Hamilton); J. Air bladder of *Dendrophysa russelli* (Cuvier) T.L. 117 mm; K. Air bladder of *Chrysochir aureus* (Richardson) T.L. 226 mm. (a) Lateral arborescent tubules, (b) Anterior tubules, (c) Posterior tubules.

Remarks: Johnieops bleekeri (Day, 1878) has been treated as a synonym of *Argyrosomus argentatus* (Houttuyn) by Fowler (1933). *Argyrosomus argentatus* is a sciaenid fish of Japan and China coasts and does not occur in India. Air bladder of *Argyrosomus argentatus* is given by Chu, Lo and Wu (1963) which is different from that of *Johnieops bleekeri.*

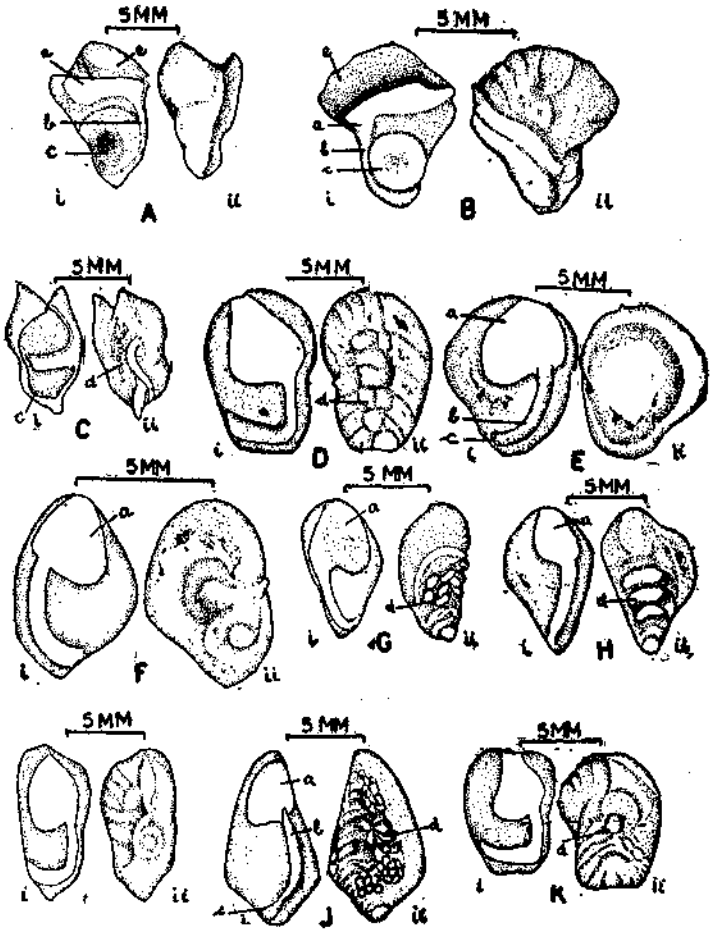

Fig. 2. A. Sagitta of *Johnius carutta* Bloch; B. Sagitta of *Johnieops dussumieri* (Cuvier); C. Sagitta of *Kathala axillaris* (Cuvier); D. Sagitta of *Nibea diacanthus* (Lacepede); E. Sagitta of *Pennahia aneus;* F. Sagitta of *Atrobucca nibe* (Jordan and Thompson); G. Sagitta of *Chrysochir aureus* (Richardson); H. Sagitta of *Otolithes ruber* (Bloch and Schneider); I. Sagitta of *Otolithoides biaurites* (Cantor); J. Sagitta of *Panna microdon* (Bleeker). K. Sagitta of *Macrospinos cuja* (Hamilton). (a) Lateral anterior inner depression; (b) Marginal groove; (c) Lateral posterior inner depression; (d) Lateral outer granules; (e) Anterior extension. (i) Inner lateral view; (ii) outer lateral view.

Genus 3. **Umbrina** Cuvier

Umbrina Cuvier, 1817, *Regne animal*, 2: 297, (Genotype: *Sciaena cirrosa* Linnaeus, type locality: Mediterranean Sea (Coast of Moracco); Gunther, *Cat. Fish. Br. Mus.*, 2: 273-274, 1860; Day, *Fish. India:* 181-182, 1878; Trewavas, *Ann. Mag. nat. Hist.*, (13) 5: 174, 1962; *Copeia*, 108, 1964; *Bull. zool. Nomencl.*, 23, part 1: 5, 1966.

Gas bladder simple, ovoid, tapering bluntly anteriorly and sharply posteriorly, no lateral arborescent tubules or anterior outpushing (Fig. 1G); lateral line pores well developed; rostral, marginal and mental pores distinct; three rostral pores on snout, five marginal pores on free margin of snout which is lobulated; mental pores five, median pore at tip of a short barbel, inner and outer pores well developed on each sides; teeth not differentiated in lower jaw, uniformly villiform; mouth inferior; median mental barbel present. D.X, 1, 21 - 29.

Species from India

1. *Umbrina sinuata* (Day, 1878). (= *Sciaena sinuata* Day, 1878); West coast of India, Persian Gulf and Natal coast.

Genus 4. **Kathala** Mohan

Kathala Mohan, 1969. *Curr. Sci.*, 38: 295; Genotype, *Corvina axillaris* Cuvier, 1830; type locality Malabar coast. *Dhoma* Talwar and Joglekar, 1970, *J. mar. biol. Ass. India*, 10: 361-365 Genotype: *Corvina axillaris* Cuvier, 1830.

Air bladder simple, round anteriorly, tapering behind, a horn-like tubule on each side antero-dorsally (Fig. 1H); sagitta broad, anteriorly with an indent and extension, pointed posteriorly, marginal groove terminates posteriorly with a crescentic pit, anterior depression on the inner lateral side shallow, outer lateral side elevated with median furrows (Fig. 2C); snout with three rostral pores and five marginal pores, free margin of the snout not lobulated, indented shallow; lower jaw with five mental pores, no fleshy pad between the pores; mouth oblique; teeth well differentiated in upper jaw and slightly differentiated in lower jaw, canines absent. D.X, 1, 26 - 29.

The sciaenid genera *Larimus* Cuvier of western tropical Atlantic has more or less similar air bladder, but its geographical distribution is against including *Kathala axillaris* (Cuvier) in it (Trewavas, 1963).

Species from India

1. *Kathala axillaris* (Cuvier, 1830). (=*Corvina axillaris* Cuvier, 1830) Genotype. India, Ceylon, East Indies, Australia, Philippines.

Genus 5. **Macrospinosa** Mohan

Macrospinosa Mohan, 1969. *Curr. Sci.*, 38 (12): 295; Genotype: *Bola cuja* Hamilton, type locality: Ganges estuary.

Air bladder simple, round in front, with a pair of bifurcated short tubules on each side dorsally, no lateral arborescent tubules; the bladder tapers posteriorly as a narrow tube to the base of anal fin (Fig.2); otolith broad with truncated anterior and posterior ends; marginal groove deep, curved posteriorly, the anterior depression distinct, erect, outer lateral sides with granules (Fig 2K); snout with three distinct rostral pores and five marginal pores; free margin of the snout lobulated; lower jaw with six distinct mental pores, two median pores close together, and an inner and outer mental pore on each side; no fleshy pads between the pores; outer row of teeth in both jaws enlarged, no canines, inner row of teeth villiform, mouth oblique, terminal, upper jaw not overhanging the lower, second anal spine very strong, equal to postorbital length. D.X, 1, 28.

Species from India

1. *Microspinosa cuja* (Hamilton, 1822). (=*Bola cuja* Hamilton, 1822) (Genotype), Ganges estuary, Sitang river (Burma).

Remarks: Fowler (1933) wrongly synonymised *Macrospinosa cuja* (Hamilton, 1822) with *Corvina cuja* Temminck and Schlegel, 1843 = *Sciaena mitsukurii* Jordan and Snyder, 1911, a Pacific Ocean species which has an air bladder with 24 - 25 arborescent tubules. Chu, Lo and Wu (1963) placed this species in the genus *Wak* Lin (1938).

Genus 6. **Otolithoides** Fowler

Otolithoides Fowler, 1933, *Bull. U. S. nat. Mus.*, **100, 12:** 364; Genotype: *Otolithus biauritus* Cantor, 1850, type locality: Sea of Penang, Malaya. Weber and de Beaufort, *Fish. Indo-Aust. Archipel.*, **7:** 499-500, 1936. Chu, Lo and Wu, *Monogr. fish. China:* 36-37, 1963. Yazdani, *J. zool. Soc. India*, **15:** 65, 1963 (1966). Dutt and Thankam, *J. Bombay nat. Hist. Soc.*, **65** (2): 343, 1968.

Sciaenoides Blyth, 1860, *J. Asiat. Soc. Beng.*, **29:** 139; genotype: *Otolithus biauritus* Cantor 1850, type locality: Sitang river. Day, *Fish. India:* 193, 1878.

Pama Fowler, 1933. *Bull. U. S. nat. Mus.*, 100, **12:** 364-367; Genotype: *Bola pama* Hamilton, 1822; type locality: Calcutta. Weber and de Beaufort, *Fish. Indo-Aust. Archipel.*, **7:** 475, 1936. Yazdani, *J. zool. Soc. India*, **15:** 65, 1963 (1966).

Gas bladder simple, a tubule originates from the posterior end of air bladder on each side extending to head and communicating with the floor of cranium; a knob present at posterior end; lateral arborescent tubules absent (Fig. 1D). Otolith broad and thick, marginal groove narrow, erect, anterior inner impression small, outer side with deep furrows (Fig. 2J); three indistinct rostral pores on snout, five marginal pores on free margin of snout, which is not lobulated; lower jaw with three mental pores on each side; teeth differentiated in upper jaw with two canines on each side and lower jaw with an outer row of enlarged teeth and an inner row of villiform teeth; body elongate, mouth oblique, upper jaw not overhanging the lower jaw. D.IX,1, 27 - 44.

Species from India

1. *Otolithoides biauritus* (Cantor, 1860). (= *Otolithus biauritus* Cantor, 1860) =*Otolithus brunneus* Day, 1873. West and east coasts of India, Malay Peninsula, East Indies, Hong Kong, Philippines.

2. *Otolithoides pama* (Hamilton, 1822). (= *Bola pama* Hamilton, 1822); Hooghly estuary, Burma, Malay Peninsula, East Indies.

Remarks: The genus *Pama* (Fowler, 1933) is not recognised as the generic diagnostic characters such as gas bladder and sagitta of its type species *Otolithoides pama* is same as that of *Otolithoides biauritus*. Syntypes and lecotypes of *O. brunneus* (Day) and *O. biauritus* (Cantor) were examined and the former is a synonym of the latter (Mohan, in press).

Genus 7. **Panna** Mohan

Panna Mohan, 1969, *Curr. Sci.*, **38** (12): 296, Genotype: *Otolithus microdon* Bleeker, 1849; type locality: Batavia (East Indies).

Gas bladder round anteriorly, tapering posteriorly, no lateral arborescent tubules but with two anterior branches, one of them extends to head and the other posteriorly to base of anal fin on both sides, terminating blindly (Fig. 1F); sagitta elongated anteriorly and pointed posteriorly; outer anterior lateral impression not deep, marginal groove curved, deep posteriorly, inner side with longitudinal and horizontal grooves (Fig. 2I); snout with three indistinct rostral pores and five marginal pores; lower jaw with six mental pores, two median and an inner and outer mental pores on each side; body elongate; mouth oblique, terminal; outer row of enlarged teeth in both jaws and inner row of villiform teeth; anteriorly upper jaw with a pair of canines, no canines in lower jaw. D.VII-IX, I, 33 - 34.

Species from India

1. *Panna microdon* (Bleeker, 1850). (= *Otolithus microdon* Bleeker, 1850); Singapore, East Indies, Southern China.

Genus 8. **Otolithes** Oken

Otolithes, Oken, ISIS, 1782: 1817; Genotype: *Johnius ruber* Bloch; type locality: Tranquebar (India). Cuvier, *Regne animal*, **2**: 229, 1817. Fowler, *Bull. U.S. nat. Mus.*, **100**, **12**: 353, 1933. Weber and de Beaufort, *Fish. Indo-Aust. Archipel.*, 7: 487, 1936. Smith, *Sea fish. S. Afr.* (4th ed.): 226, 1953. Herre, *Checklist of Philippine Fishes*, 473: 1953. Chu, Lo and Wu, *Monogr. Fish. China:* 44, 1963. Yazdani, *J. zool. Soc. India*, **15**: 65, 1963 (1966). Dutt and Thankam, *J. Bombay nat. Hist. Soc.*, **65** (2): 335-347, 1968.

Otolithus Cuvier, 1839, *Regne animal*, 2 ed., **11** : 172, Genotype; *Johnius ruber* Bloch, type locality: Tranquebar, (India). Cuvier, *Hist. nat. Poiss.* **5**: 59, 1830. Gunther, *Cat. Br. Mus.*, **2**: 305, 1860. Bleeker, *Natuurk. Verh. Koninkl. Akad.*, **14**: 6, 1874. Day, *Fish. India*, 195, 1878. Collingnon, *Bull. Inst. Oceanogr.*, No. 1155: 4—5, 1959; *Bull. Inst. Etud. centafr.* No. 19-20, 1960. Trewavas, *Ann. Mag. nat. Hist.*, (13) **5**: 172, 1962.

Gas bladder round anteriorly, tapering posteriorly with 25-30 lateral arborescent tubules, no anterior lateral outpushings (Fig. 1E); otolith (sagitta) elongated, triangular in shape, anterior lateral impression erect, marginal groove distinct, not curved posteriorly, posterior end pointed, lateral inner side elevated with furrows (Fig. 2H); snout with three indistinct rostral pores, marginal pores five, free margin of snout not lobulated, lower jaw with two median mental pores; mouth terminal, upturned, two or three canines in upper jaw and one or two in lower jaw, inner row of small teeth and outer row of enlarged teeth in both jaws. D.IX-XI, 24-31; A.II, 7-11.

Species from India

1. *Otolithes ruber* (Bloch and Schneider, 1801). (= *Johnius ruber* Bloch and Schneider, 1801); east coast of Africa to Singapore.
2. *Otolithes argenteus* (Cuvier), 1830. (= *Otolithus argenteus* (Kuhl and Van Hasselt) Cuvier, 1830); east coast of Africa to Singapore, East Indies, South China.
3. *Otolithes maculatus* (Cuvier, 1830). (= *Otolithus maculatus* (Kuhl and Van Hasselt) Cuvier, 1830); India, Burma, Malaya, East Indies, Siam.

Genus 9. **Pennahia** Fowler

Pennahia Fowler, 1926. *J. Bombay nat. Hist. Soc.*, 30 (4): 776; (Genotype: *Johnius aneus* Bloch, 1793; type locality: Malabar).

Gas bladder round in front, tapering behind, with about twenty thin lateral arborescent tubules on each side. Tubules short and do not extend to head (Fig. 1C); otolith compressed, broad, more wide than long, the marginal groove erect without any depression posteriorly; the depression on the anterior lateral side not distinct (Fig. 2E); rostral pores three, indistinct, marginal pores five, free border of snout without lobulation; mental pores four—two median and an inner mental pore on each side; mouth oblique, terminal, pointing upwards; snout not overhanging lower jaw; upper and lower jaw with an outer row of enlarged teeth and inner villiform teeth; gill rakers as long as eye. D.X, 22 - 24; A.II. 7.

Species from India

1. *Pennahia aneus* (Bloch, 1793). (= *Johnius aneus* Bloch, 1793); Genotype; India, Singapore, Java, Borneo, Philippines, Southern China.

Genus 10. **Atrobucca** Chu, Lo and Wu

Atrobucca Chu, Lo and Wu, 1963. *Monogr. Fish. China:* 64, 93; Genotype: *Sciaena nibe* Jordan and Thompson, 1911; type locality: East coast of southern Japan.

Gas bladder round in front, tapering behind; twenty to twenty eight thin arborescent tubules with long dorsal and ventral branches; otoliths (sagitta) flat

marginal groove and the depression of the anterior lateral side distinct, not erect, posterior portion of the marginal groove not deep; anterior and posterior sides pointed (Fig. 2F); rostral pores on snout three, indistinct; marginal pores five, free margin of snout not lobulated; lower jaw with five mental pores, one median and an inner and outer pore on each side; mouth oblique, terminal; teeth in both jaws differentiated; outer row of teeth in upper jaw and lower jaw slightly enlarged. D.X, 1, 27 - 28.

Species from India

1. *Atrobucca nibe* (Jordan and Thompson, 1911). (= *Sciaena nibe* Jordan and Thompson, 1911); Genotype. East coast of India (Calcutta, Waltair), Singapore, East Indies, Southern China, Japan.

Remarks: Apart from my collection, Appa Rao (MS) also has reported this species from Waltair. Fowler (1933) wrongly snynonymised this species with *Johnius argentatus* (Houttuyn) which is not reported from India.

Genus 11. **Argyrosomus** de la Pylaie

Argyrosomus de la Pylaie, 1835, *Congr. Sci. Fr. Potiers*, 1832 & 1833, 524; Genotpye: *Sciaena aquila* Lacepede, 1803; type locality: Dieppe (France); Lin, *J. Hong Kong Fish. Res. Stn*, 1: 243, 1940. Chu, Lo and Wu, *Monogr. fish. China:* 57-58, 1963.

Pseudosciaena Bleeker, 1863, *Nederland Tijdschr. Dierk*, 1: 142, Genotype: *Sciaena aquila* Risso; type locality: Dieppe, Bleeker, *Natuurk. vech. Koninkl. Akad.*, 14: 18-29, 1874. Fowler, *Bull. U. S. nat. Mus.*, 100, 12: 368, 1933. Weber and de Beaufort, *Fish. Indo-Aust. Archipel*, 7: 505, 1936. Herre, *Checklist of Philippine Fishes:* 473, 1953. Trewavas, *Ann. Mag. nat. Hist. Soc.*, (13) 5: 172, 1962. Yazdani, *J. zool. Soc. India*, 15: 65, 1963 (1966). Trewavas, *Bull. zool. Nomencl.*, 23 (1): 5, 1966.

Gas bladder round in front, without anterior lateral outpushings; lateral arborescent tubules about twenty, posteriorly air bladder tapers and extends to anal base; snout with three rostral pores and five marginal pores, free margin of the snout not lobulated; lower jaw with six mental pores, —two median and one outer and inner mental pore on each side; upper and lower jaws with outer enlarged teeth and inner villiform teeth, no canines; mouth oblique. D.X, 1, 27 - 29.

Species from India

1. *Argyrosomus hololepidotus* (Lacepede, 1802). (= *Labrus hololepidotus* Lacepede 1802); Eastern Tropical Atlantic, Mediterranean, Red Sea, East Africa to West cost of India, Australia.

Genus 12. **Dendrophysa** Trewavas

Dendrophysa Trewavas, 1964, *Copeia*, 110-111, 1964: (Genotype: *Umbrina russelli* Cuvier, 1930; Type locality: Coremandol coast). Dutt and Thankam, *J. Bombay nat. Hist. Soc.*, 65 (2): 342, 1968. Sinha and Babu Rao, *Copeia*, No. 1: 77, 1969.

Gas bladder round in front, no lateral outpushings, lateral arborescent tubules short, 14 - 15, posteriorly the gas bladder tapers and extends to base of anal fin (Fig. 1J). Otolith longer than broad, marginal groove deep, erect with a distinctly deep posterior groove; rostral pores three, distinct; free border of snout deeply lobulated; marginal pores five median marginal pore on the median lobe, inner and outer pores deep; mental pores five, no fleshy pads around the pores, median pore on base of mental barbel, mouth inferior, horizontal, snout overhangs lower jaw; teeth differentiated in upper jaw, uniformly villiform on lower jaw, a median mental barbel present. D.X, 1, 27 - 28.

Species from India

1. *Dendrophysa russelli* (Cuvier, 1830). (= *Umbrina russelli* Cuvier, 1830); India, Malay Peninsula, East Indies, Philippines.

Genus 13. **Nibea** Jordan and Thompson

Nibea Jordan and Thompson, 1911, *Proc. U.S. nat. Mus.*, 39: 246; (Genotype: *Pseudotolithes mitsukurii* Jordan and Snyder, 1901; Type locality: Tokyo, Awa, Matsushima, Wakanoura (East coast of Japan). Chur, Lo and Wu, *Mongr. fish. China:* 47-48, 1963. Dutt and Thankam, *J. Bombay nat. Hist. Soc.*, 65 (2): 340, 1965.

Gas bladder anteriorly round with 18 - 20 lateral arborescent tubules. First anterior branch short, not extending to head, bladder posteriorly tapering, extends to the base of anal fin (Fig. 1B); otolith (sagitta) thick, elongate, marginal groove curved, the anterior depression on lateral inner side distinct, outer side elevated with granules (Fig. 2D); rostral pores three, marginal pores five; mental pores five; two median mental pores joined as to form a crescentic groove, a slit-like inner mental pore and an outer mental pore on each side of it; free margin of snout not deeply lobulated; barbels may or may not be present; mouth oblique or nearly horizontal; upper jaw slightly or not overlapping the lower jaw; teeth differentiated in upper jaw, may or may not be differentiated in lower jaw. D.IX-X, 1, 22-30.

Species from India

1. *Nibea maculatus* (Bloch and Schneider, 1801). (= *Johnius maculatus* Bloch and Schneider, 1801); India, Ceylon, Malaya.

2. *Nibea albida* (Cuvier, 1830). (= *Bola coibor* Hamilton, 1822). (= *Dendrophysa hooghliensis* Sinha and Babu Rao, 1969); India.

3. *Nibea diacanthus* (Lacepede, 1802). (= *Lutjanus diacanthus* Lacepede, 1802); Mozambique, India, East Indies, China.

4. *Nibea soldado* (Lacepede, 1902). (= *Holocentrus soldado* Lacepede, 1802); Mozambique, Madagascar, India, East Indies, Philippines, Indo-China.

5. *Nibea semiluctuosus* (Cuvier, 1830). (= *Corvina semiluctuosa* Cuvier, 1830); Coasts of India, East Indies, Philippines and China.

Remarks: *Dendrophysa hooghliensis* Sinha and Babu Rao, 1969 seems to be a junior synonym of *Nibea albida* (Cuvier). This species cannot be included in *Dendrophysa* as it has differentiated teeth in lower jaw. The genotype of *Dendrophysa* (*D. russelli*) has villiform teeth in lower jaw. Hamilton (1822) attributes 3 spines in the anal fin of *Bola coibor* Hamilton; hence it is not recognised here. Dr. E. Trewavas of British Museum (personal communication) has examined the holotype of *N. semiluctuous* (Cuvier) from Paris Natural History Museum and confirms that this species belongs to *Nibea* Jordan and Thompson.

Genus 14. **Chrysochir** Trewavas and Yazdani

Chrysochir Trewavas and Yazdani, 1965, *Ann. Mag. nat. Hist.*, (13) **8**: 250-251; Genotype: *Otolithus aureus* Richardson, 1846; type locality: Canton, China (Neotype: Hong Kong).

Gas bladder round in front, no lateral anterior outpushings, lateral arborescent tubules short, about 27 - 29, posteriorly the gas bladder tapers and extends to base of anal fin; otoliths (sagitta) elongate, marginal groove erect, anterior lateral impression distinct, outer lateral side with granules snout with three distinct rostral pores; free margin of snout with five marginal pores with lobes, lower jaw with three pairs of mental pores—a pair of median mental pores, and one inner and outer pores on each side, no pads around the pores; mouth inferior, snout overhanging the lower jaw, cleft of mouth horizontal; upper jaw with two canines on each side and outer row of enlarged teeth and inner row of villiform teeth; lower jaw with inner row of villiform teeth and outer row of enlarged teeth, canines absent in lower jaw. D.X, I, 26 - 27.

Species from India

1. *Chrysochir aureus* (Richardson, 1846). (= *Otolithus aureus* Richardson, 1846). East coast of India, Singapore, Hong Kong, South China coast.

Remarks: This species was described by Alcock (1889) as *Sciaena ophiceps* from the Orissa coast.

Type species, authors and years of the genera of Indian sciaenids with remarks on their validity have been given in Table. 1.

Synoptic Key to the Genera of Indian Sciaenids

1. (a) Air bladder with anterior lateral outpushings, lateral arborescent tubules present, otolith (sagitta) with deep posterior depression and anterior extension 2

   (b) Air bladder without anterior lateral outpushing, lateral arborescent tubules may or may not be present, otolith (sagitta) with shallow or no posterior depression, no anterior extension 3

2. (a) Five sensory pores on lower jaw separated by fleshy pads, lower jaw with villiform teeth ..... 1. *Johnius* Bloch

TABLE 1. *Type species, authors and years of the genera of Indian sciaenids with remarks*

Genera	Authors	Years	Types	Remarks
Argyrosomus	de la Pylaie	1835	*Sciaena aquila* Lacepede	Valid
Atrobucca	Chu, Lo and Wu	1963	*Sciaena nibe* Jordan & Thompson	Valid
Bola	Hamilton	1822	*Bola coiter*	Not valid, tautonym of *Cyprinus bola* Hamilton
Chrysochir	Trewavas and Yazdani	1965	*Otolithus aureus* Richardson	Valid
Collichthys	Gunther	1860	*Sciaena lucida* Richardson	Valid
Corvina	Cuvier	1829	*Sciaena umbra* Linnaeus	Junior synonym of *Sciaena* Linnaeus
Dasysciaena	Talwar	1970	*Corvina albida* Cuvier	Not valid, subjective synonym of *Nibea* Jordan and Thompson.
Dendrophysa	Trewavas	1964	*Umbrina russelli* Cuvier	Valid
Dhoma	Talwar and Joglekar	1970	*Corvina axillaris* Cuvier	Not Valid, junior synonym of *Kathala* Mohan
Johnius	Bloch	1793	*Johnius carutta* Bloch	Valid
Johnieops	Mohan	—	*Sciaena osseus Day*	Gen. nov.
Kathala	Mohan	1969	*Corvina axillaris* Cuvier	Valid
Macrospinosa	Mohan	1969	*Bola cuja* Hamilton	Valid
Nibea	Jordon and Thompson	1911	*Pseudotolithus mitsukurii* Jordan and Snyder	Valid
Otolithes	Oken	1782	*Johnius ruber* Bloch	Valid
Otolithus	Cuvier	1829	*Johnius ruber* Bloch	Not valid, junior synonym of *Otolithes* Oken
Otolithoides	Fowler	1933	*Otolithus biauritus* Cantor	Valid
Pama	Fowler	1933	*Bola pama* Hamilton	Not valid, junior synonym of *Otolithoides* Fowler
Panna	Mohan	1969	*Otolithus microdon* Bleeker	Valid
Pennahia	Fowler	1926	*Johnius aneus* Bloch	Valid
Pseudosciaena	Bleeker	1863	*Sciaena aquila* Lacepede	Not valid, junior synonym of *Argyrosomus* de la Pylaie
Sciaena	Linnaeus	1758	*Sciaena umbra* Linnaeus	Valid
Sciaenoides	Blyth	1860	*Otolithus biaurites* Cantor	Preoccupied by *Sciaenoides* Richardson, not valid
Umbrina	Cuvier	1817	*Sciaena cirrosa* Linnaeus	Valid
Wak	Lin	1938	*Bola coiter* Hamilton	Not valid, junior synonym of *Johnius* Bloch

(b) Five sensory pores on lower jaw, but fleshy pad absent, lower jaw with enlarged teeth .....2. *Johnieops* gen. nov.

3. (a) Air bladder simple, ovoid with no arborescent tubules ..... 3. *Umbrina* Cuvier

(b) Air bladder with tubules 4

4. (a) Air bladder with one or two pairs of tubules 5

(b) Air bladder with more than 15 pairs of lateral arborescent tubules 8

5. (a) Air bladder with short tubules anteriorly.....6

(b) Air bladder with long tubules anteriorly or posteriorly 7

6. (a) One pair of tubules anteriorly .....4. *Kathala* Mohan

(b) Two pairs of tubules anteriorly .....5. *Macrospinosa* Mohan

7. (a) Two pairs of tubules originate anteriorly, one extending into head and other to base of anal fin .....6. *Panna* Mohan

(b) A pair of tubules originate at the posterior end of air bladder and ramify into head .....7. *Otolithoides* Fowler

8. (a) Lower jaw with 2-4 mental pores 9

(b) Lower jaw with 5-6 mental pores 10

9. (a) Well-developed canines in both jaws, two mental pores (sensory pores of lower jaw).....8. *Otolithes* Oken

(b) No canines in lower jaw, outer row of teeth in lower jaw enlarged, four mental pores .....9. *Pennahia* Fowler

10. (a) Lateral arborescent tubules long, ramify into dorsal and ventral branches, mental pores not distinct 11

(b) Lateral arborescent tubules short, mental pores distinct 12

11. (a) Lateral arborescent tubules forming a complicated system of net work, mental pores five .....10. *Atrobucca* Chu, Lo and Wu

(b) Lateral arborescent tubules short, do not form a network, mental pores six .....11. *Argyrosomus* de la Pylaie

12. (a) Lower jaw teeth well differentiated 13

(b) Lower jaw teeth villiform, not differentiated ..12. *Dendrophysa* Trewavas

13. (a) Upper jaw without canines .....13. *Nibea* Jordon and Thompson

(b) Upper jaw with canines .....14. *Chrysochir* Trewavas and Yazdani

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