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Systematic notes on some cyprinid fishes collected from Kasargod district of Kerala, India

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ABSTRACT

. Fishes of the family Cyprinidae include carps, barbs, minnows, etc. They are the most diverse and prevalent group of freshwater species distributed in the aquatic bodies of India and nearby countries. In Kerala they predominate in freshwater capture fisheries. Most of the cyprinids are economically important as ornamental and food fishes. Taxonomic studies conducted on cyprinid species of Kerala state are scarce; no detailed systematic studies were done on these fishes of Kasargod district in Kerala, India. During this study a detailed survey was conducted on various cyprinoid fish species of Kasargod district. Taxonomically important features such as meristic counts and morphometric characters were analyzed and compared with their congeners. Twenty species of cyprinids were collected during the study period. These species belong to thirteen genera (*Barilius*, *Dawkinsia*, *Devario*, *Garra*, *Haludaria*, *Hypselebarbus*, *Labeo*, *Puntius*, *Rasbora*, *Sahyadria*, *Salmostoma*, *Systomus*, and *Tor*). They showed their preponderance in most of the aquatic bodies of Kasargod district. Three new species (*Barilius cyanochlorus*, *Hypselobarbus nitidus* and *Puntius ocellus*) were discovered, described, and named during this study period.

INTRODUCTION

Cyprinids, the most common and predominant group of teleost fishes, are distributed in the freshwater bodies of Africa, Asia, Australia, central and north America, New Zealand and New Guinea. **Rainboth (1991)** listed 177 genera of Asian cyprinids and they grouped under 7 subfamilies. They show the greatest diversity in southeastern Asia. Most of the cyprinids are economically significant and are used as food and ornamental fishes; they can also be utilized for the biological control of some pest species. They make the largest part of biomass in most water bodies and are the major species of fish consumed across the globe. They are popular sport fishes owing to their strength, size and also due to abundance in numbers.

Cyprinoid fishes can be distinguished by a compressed body with a rounded abdomen having a sharp edge; their mouth is mostly terminal and protractile; they are toothless but having distinct pharyngeal teeth which are very important in their classification. Gill openings wide; gill membranes joined with isthmus; pelvic fins abdominal, behind to pectoral fins (**Talwar & Jhingran, 1991; Jayaram, 2010).**

Many systematic studies have been conducted on the cyprinid fishes of Kerala **(Plamoottil, 2018; Plamoottil & Johnson, 2020a, 2020b; Plamoottil 2021a, 2021b)**. Some revisions have also

been published **(Jayaram, 1991** and **Jayaram & Dhas, 2000)**. **Day (1865, 1878 & 1889)** and **Jerdon (1849)** newly described many cyprinid fishes from the water bodies of the state. Many new *Puntius* **(Plamoottil & Vineeth, 2020a)**, *Barilius* **(Plamoottil & Vineeth, 2020b)** and *Labeo* **(Plamoottil &Zupancic, 2017)** species were described from the freshwater bodies of Kerala during the last decade.

Kasargod, the northernmost district of the Kerala State, situated on the rich biodiversity of Western Ghats, is blessed with maximum- twelve- numbers of west flowing rivers. The district is also blessed with estuaries, backwaters and lowland belts. The complex topography, significant rainfall and warm humid tropical climate have created a variety of ecological niches with rare and unique animals and plants. Research works concentrated solely on taxonomic aspects on ichthyofauna of Kasargod district are rare. It was an endeavor to study systematic details of various cyprinid fish species collected from Kasargod district

MATERIALS AND METHODS

Fishes were collected from different locations **(Table 1** and **Figs. 1-10)** of Kasargod district during the period from May 2019 to May 2021 by using gill nets and cast nets. Collected fishes were preserved in 10% formalin; after the fixation they were taken out and identified following **Jayaram (2002)**, **Day (1865, 1878 &1889)**, **Talwar &Jhingran (1991)** and **Jayaram & Dhas (2000)**. Measurements were made point to point with dial calipers and data recorded to tenths of a millimetre. The systematic identification was based mainly on meristic, morphometric and other relevant characteristics. Measurements and counts were made on the left side of specimens. In the meristic counts of fin rays, lower case Roman numerals indicate soft or hard unbranched rays and Arabic numerals indicate branched rays. Length of head and other measurements of body parts are given as percentage of standard length (SL). Parts of head are presented as percentage of head length (HL). The specimens are now deposited in the museum at Department of Zoology, BJM Govt. College, Chavara, Kerala (DOZ GCC).

List of Abbreviations:

D- Dorsal fin rays; **P**- Pectoral fin rays; **V**- Ventral fin rays; **A**- Anal fin rays, **C**- Caudal fin rays; **LLS**- Lateral line scales; **PDS**- Pre-dorsal scales; **LL/D**- Scales between lateral line and dorsal fin; **LL/V**- Scales between lateral line and ventral fin; **LL/A**- Scales between lateral line and anal fin; **CPS**- Circumpeduncular scales; **HL**- Head length; **HD**- Head depth; **HW**- Head width; **BDD**- Body depth at dorsal fin; **BDA**- Body depth at anal fin; **BWD**- Body width at dorsal fin; **BWA**- Body width at anal fin; **PRL**- Pre dorsal length; **PDL**- Post dorsal length; **PRPL**- Pre pelvic distance; **PRA**- Pre anal distance; **LD**- Length of dorsal fin; **LP**- Length of pectoral fin; **LV**- Length of ventral fin; **LA**- Length of anal fin; **LC**- Length of caudal fin; **LBD**- Length of base of dorsal fin; **LBA**- Length of base of anal fin; **LCP**- Length of caudal peduncle; **DCP**- Depth of caudal peduncle; **WCP**- Width of caudal peduncle; **DP-PL**- Distance from pectoral fin to pelvic fin; **DPL-A**- Distance from pelvic fin to anal fin; **CA-C**- Distance from anal fin to caudal fin; **DPV**- Distance from pelvic fin to vent; **DAV**- Distance from anal fin to vent; **ED**- Eye diameter; **IOW**- Inter orbital width; **INW**- Inter narial width; **WGM**- Width of gape of mouth; **STL**- Snout length.

Table (1): Location details of the cyprinoid fishes collected from Kasargod district

SL. NO	Name of fish	Location	River
1	*Barilius ardens*	Kammadam	Karyamkode River
2	*Barilius canarensis*	Kolichal	Panathur River
3	*Barilius cyanochlorus*	Chully	---
4	*Barilius malabaricus*	Malom	Karyamkode River
5	*Dawkinsia assimilis*	Arayi	Arayi River
6	*Dawkinsia filamentosa*	Malom	Neelipuzha
7	*Devario malabaricus*	Konnakkaad	Karyamkode River
8	*Garra mullya*	Neyymkayam	Payaswini River
9	*Haludaria fasciata*	EramkunnuChaal	Neelipuzha
10	*Hypselobarbus curmuca*	Mukkada	Karyamkode River
11	*Hypselobarbus nitidus*	Pallamkode	---
12	*Labeo rohita*	Arayi	Arayi River
13	*Labeo nigrescens*	Panathur	PanathurPuzha
14	*Puntius denisoni*	Eranjipuzha	Payaswini River
15	*Puntius ocellus*	Kasargod	Chandragiri River
16	*Puntius vittatus*	Eranjipuzha	Payaswini River
17	*Rasbora dandia*	EramkunnuChaal	Neelipuzha
18	*Salmostoma boopis*	Eranjipuzha	Payaswini River
19	*Tor khudree*	Kolichal	Panathur River
20	*Systomus subnasutus*	Periyanganam	Karyamkode River

Fig. (1): *Aarayipuzha*

Fig. (2): *Nileswaram*

Fig. (3): *Chayyoth*

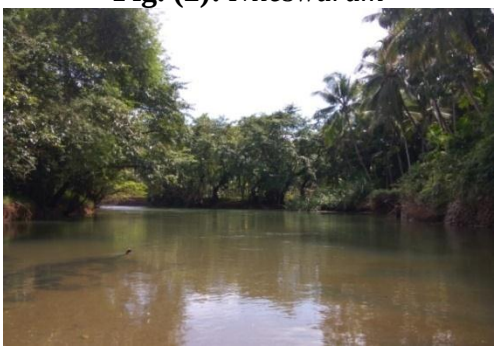

Fig. (4): *Madikkai*

Fig. (5): *Konnakkad*

Fig. (6): *Mukkada*

Fig. (7): *Eranjipuzha*

Fig. (8): *Panathur*

Fig. (9): *Mallam*

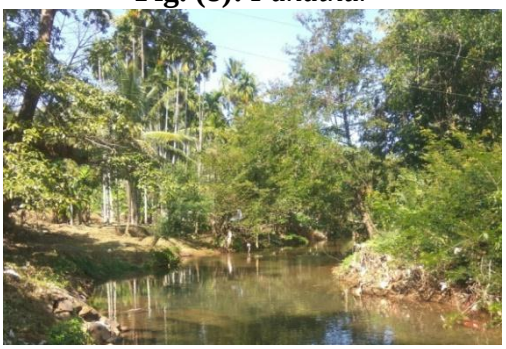

Fig. (10): *Vellarikkundu*

Figs. (1-10): Photographs for different sites of fish collection in the study area

RESULTS AND DISCUSSION

In Kasargod district, among freshwater fishes, Cyprinidae is the largest family comprised of carps, barbs, *Rasbora* and minnows. Ten genera (*Barilius, Dawkinsia, Devario, Garra, Haludaria, Hypselebarbus, Labeo, Puntius, Rasbora, Sahyadria, Salmostoma, Systomus* and *Tor*)showed their preponderance in most of the aquatic bodies of Kasargod district.

Twenty species of cyprinids were collected during the study period. Most of them are ornamental and food fishes. *Barilius cyanochlorus*, *Hypselobarbus nitidus* and *Puntius ocellus* were three new species discovered, described and named during this study period. Taxonomic details of these fishes are recorded below **(Table, 2** and **Figs. 11- 30)**.

1. *Barilius ardens* Knight *et al.*, 2015 (Fig. 11)

Barilius ardens Knight, Rai, D'Souza &Vijayakrishnan, 2015. Zootaxa, **3926** (3): 396-412. (Type locality: Swarna River, Karnataka).

Diagnosis: Barbels absent. Ten vertically elongate markings of 4-6 scales high and 2-3 scales wide. Proximal part of dorsal and anal fin black and with broad orange margins.

Meristic counts: D- ii, 11; P- i, 13; V- i, 8; A- iii, 14: C- iii, 17, iii; LLS- 40; PDS- 17; CPS- 7; LL/D- 9.1/2; LL/V- 3.1/2; LL/A- 3.1/2.

Morphometric characters: TL (mm)- 105.0; SL (mm)- 82.0; HL (mm)- 23.0. **% SL:** HL- 28.0; HD-21.9; HW- 14.6; BDD- 32.9; BDA- 28.0; BWD- 15.8; BWA- 10.9; PRL- 51.2; POL- 52.4; PRPL- 48.7; PRA-63.4; LD- 18.2; LP- 24.3; LV- 15.8; LA- 21.9; LC- 35.3; LBD- 20.7; LBA- 20.7; LCP- 19.5; DCP- 12.1; WCP- 4.87; DP-PL- 23.1; DPL-A- 15.8; DA-C- 31.7; DPV- 13.4; DAV- 2.43. **% HL:** HD- 78.2; HW-52.1; ED- 39.1; IOW- 39.1; INW- 21.7; STL- 26.0; WGM- 21.7.

Other characteristics: Barbels absent. Dorsal fin inserted towards tip of snout than base of caudal fin; its last unbranched ray smooth and flexible.

2.*Barilius canarensis* (Jerdon, 1849) (Fig. 12)

Opsarius canarensis Jerdon, 1849, *Madras Journal of Literature and Science,***15**: 329 (Type locality: Canara, Karnataka)

Diagnosis: Body laterally compressed and deep. Dorsal fin inserted in advance of anal fin. Flank with a double row of large vertical green spots along the body.

Meristic counts: D- ii, 11; P- i, 12; V- i, 8; A- ii, 15: C- iii, 16; LLS- 37; PDS- 15; CPS- 6; LL/D-8.1/2; LL/V- 2.1/2; LL/A- 2.1/2.

Morphometric characters:TL (mm)- 127.0; SL (mm)- 103.0; HL (mm)- 27.0. **% SL:** HL- 26.2; HD-21.3; HW- 13.5; BDD- 32.0; BDA- 29.1; BWD- 11.6; BWA- 7.76; PRL- 50.4; POL- 54.3; PRPL- 46.6; PRA- 63.1; LD- 17.4; LP- 20.3; LV- 13.5; LA- 19.4; LC- 26.2; LBD- 19.4; LBA- 22.3; LCP- 17.4; DCP-11.6; WCP- 4.8; DP-PL- 21.3; DPL-A- 18.4; DA-C- 33.9; DPV- 15.5; DAV- 2.91. **% HL:** HD- 81.4; HW-51.8; ED- 33.3; IOW- 37.0; INW- 22.2; STL- 29.6; WGM- 6.22.

Colour and other characters: Greenish dorsum, golden on flanks and white abdomen. Fins stained dark with broad white margin. Mouth is superior; barbels absent. Well- developed tubercles on head.

3.*Barilius cyanochlorus* Plamootil&Vineeth, 2020 (Fig. 13)

Barilius cyanochlorus Plamootil &Vineeth, 2020, *Biodiversitas*, **2**: 5389-5393. (Type locality: Chully, Kasargod).

Diagnosis: Two pair of short barbels present. Eight vertical bands on mid-lateral region, each of these bands with two segments- lower blue part and upper green part- a large round blotch on caudal base with same pattern.

Meristic counts: D- ii, 11; P- i, 12-13; V- i, 8; A- ii, 13-14: C- iii, 17, iii; LLS- 37-39+1-2; PDS-14-16; CPS- 7; LL/D- 9.1/2; LL/V- 2.1/2; LL/A- 2.1/2-3.1/2.

Morphometric characters:TL (mm)- 66.5-89.0; SL (mm)- 52.2-70.0; HL (mm)- 14.5-19.0. **% SL:** HL-26.9-28.8; HD- 22.1-23.9; HW- 14.9-15.4; BDD- 30.0-32.3; BDA- 25.4-29.2; BWD- 12.6-13.8; BWA- 8.18-10.0; PRL- 49.5-52.6; POL- 49.5-54.0; PRPL- 47.6-51.2; PRA- 64.6-67.5; LD- 18.5-21.6; LP- 23.1-24.7; LV- 15.4-17.0; LA- 19.3-21.6; LC- 30.8-34.2; LBD- 18.3-20.7; LBA- 18.3-20.7; LCP- 17.4-19.9; DCP- 11.4-12.3; WCP- 4.6-5.7; DP-PL- 20.0-24.2; DPL-A- 16.1-20.1; DA-C- 30.6-32.4; DPV- 14.5-17.0; DAV- 1.3-2.0. **% HL:** HD- 80.0-84.8; HW-51.8-57.1; ED- 41.6-43.7; IOW- 35.1-37.5; INW- 20.0-23.0; STL- 22.0-26.3; WGM- 31.0-36.8.

Colour and other characters: Body with blackish- brown dorsal and upper laterals, greenish-yellow middle part and silvery lower lateral part. Base of dorsal fin brown and distal part orange, anal fin orange- red and pectoral fin pale reddish. Mouth oblique and upturned. Lower lobe of caudal fin longer than upper one. Lateral line is moderately concave and distinct throughout

4.*Barilius malabaricus* (Jerdon, 1849)(Fig. 14)

Opsarius malabaricus Jerdon, 1849, *Madras Journal of Literature and Science,***15**(2): 302- 346.

Diagnosis: Lateral line with 38 scales. one row of 9- 13 bluish- green oval spots on flanks.

Meristic counts: D- ii, 11; P- i, 12; V- i, 8; A- ii, 13: C- iii, 17, iii; LLS- 38; PDS- 14-15; CPS- 6-7; LL/D- 8.1/2-9.1/2; LL/V- 2.1/2; LL/A- 2.1/2.

Morphometric characters:TL (mm)- 101.0-109.0; SL (mm)- 81.0-90.0; HL (mm)- 22.0-23.0. **% SL:** HL- 25.5-27.1; HD-21.1- 22.2; HW- 14.4-14.8; BDD- 32.0-33.3; BDA- 28.3-28.8; BWD- 15.5-16.0; BWA- 11.1-13.3; PRL- 50.6-51.1; POL- 53.0-53.3; PRPL- 47.7-48.1; PRA- 64.4-66.6; LD- 17.7-18.5; LP- 22.2; LV- 15.5-16.0; LA- 20.0-20.9; LC- 27.7-29.6; LBD- 19.7-20.0; LBA- 20.0-20.9; LCP- 18.8-19.7; DCP- 11.1-12.3; WCP- 4.9-5.5; DP-PL- 23.3-24.6; DPL-A- 17.7-19.7; DA-C- 32.2-33.3; DPV- 15.5-17.2; DAV- 2.2-2.4. **% HL:** HD- 81.8-82.6; HW-54.5-56.5; ED- 34.7-36.3; IOW- 40.9-43.4; INW- 21.7-22.7; STL- 26.0-27.2; WGM- 22.7-26.0.

Other characteristics: Last unbranched ray of dorsal fin is flexible and smooth. Lateral line slightly curved. Basal part of dorsal and anal fin black and tipped orange.

5.*Dawkinsia assimilis* (Jerdon, 1849)(Fig. 15)

Systomus assimilis Jerdon, 1849, *Madras J. Lit. and Sci.,* p. 319 (Type locality: Canara).

Diagnosis: Dorsal fin inserted to tip of snout than base of caudal fin. Last unbranched and 1st and 2nd branched dorsal fin rays elongated. Dorsal fin with faded red- orange tinge on medial membrane towards proximal margin, but mostly hyaline.

Meristic counts: D- iii, 9; P- i, 13; V- i, 8-9; A- ii, 6: C- iii, 17, iii; LLS- 21-22; PDS- 7; CPS- 6; LL/D- 5.1/2; LL/V- 2.1/2; LL/A- 3.1/2.

Morphometric characters: TL (mm)- 123.0-158.0; SL (mm)- 92.0-118.0; HL (mm)- 27.0-35.0. **% SL:** HL- 29.3-29.6; HD- 29.3-29.6; HW- 17.7-18.4; BDD- 39.1-39.8; BDA- 26.2-27.1; BWD- 20.6-21.1; BWA- 13.5-14.1; PRL- 50.0-51.0; POL- 54.3-55.0; PRPL- 54.3-55.0; PRA- 77.1-78.2; LD- 32.6-42.3; LP- 22.8; LV- 22.2; LA- 19.4; LC- 35.8-37.2; LBD- 20.6-21.1; LBA- 10.1-10.8; LCP- 15.2-16.9; DCP- 14.4-15.2; WCP- 6.7-7.6; DP-PL- 26.2-28.2; DPL-A- 26.0-27.1; DA-C- 26.0-26.2; DPV- 23.9-24.5; DAV- 2.5-3.2. **% HL:** HD- 100.0; HW- 60.0-62.9; ED- 28.5-33.3; IOW- 40.7-42.8; INW- 25.7-29.6; STL- 31.4-33.3; WGM- 29.6-31.4

Other characteristics: Body deep. Tubercles are present and scattered across snout and nape. Maxillary barbels long, reaching anterior margin of eye. Body color is olive above lateral line, darker in dorsum. Caudal-peduncle blotch is short and pear shaped.

6.*Dawkinsia filamentosa* (Valenciennes, 1844)(Fig. 16)

Leuciscus filamentosus Valenciennes 1844, *Hist. Nat. Poiss*., **17**: 495 (Type locality: Alleppey, Kerala)

Diagnosis: Maxillary barbels very short, often hidden in grooves around corners of mouth. A dark oval blotch on lateral line above the anal fin origin. Dorsal fin rays partly dark violet, often dark tipped.

Meristic counts: D- iii, 8; P- i, 14; V- i, 8; A- ii, 5: C- iii, 17, iii; LLS- 21; PDS- 7; CPS- 5; LL/D- 4.1/2; LL/V- 2.1/2; LL/A- 3.1/2.

Morphometric characters:TL (mm)- 88.0; SL (mm)- 66.0; HL (mm)- 18.0. **% SL:** HL- 27.2; HD-19.6; HW- 16.6; BDD- 33.3; BDA- 25.7; BWD- 18.1; BWA- 12.1; PRL- 46.9; POL- 60.6; PRPL- 48.4; PRA- 71.2; LD- 33.3; LP- 24.2; LV- 25.7; LA- 18.1; LC- 36.3; LBD- 21.2; LBA- 10.6; LCP- 21.2; DCP- 13.6; WCP- 6.06; DP-PL- 24.2; DPL-A- 32.7; DA-C- 31.8; DPV- 21.2; DAV- 1.51. **% HL:** HD- 72.2; HW- 61.1; ED- 44.4; IOW- 38.8; INW- 22.2; STL- 22.2; WGM- 22.2.

Other characteristics: Last unbranched ray of dorsal fin is non- osseous, weak and smooth. Fins delicate yellow- greenish.

7.*Devario malabaricus* (Jerdon, 1849)(Fig. 17)

Perilampus malabaricus Jerdon, 1849, *Madras J. Lit.and Sci.,***15**: 325. (Type locality: Malabar)

Diagnosis: Body strongly compressed. Mouth small and directed upwards. Three well- marked lateral bands of dark blue colour run along flanks, separated by narrow yellow lines.

Meristic counts: D- i, 13; P- i, 12; V- i, 7; A- ii, 15: C- iii, 17, iii; LLS- 33; PDS- 17; CPS- 7; LL/D- 5.1/2; LL/V- 1.1/2; LL/A- 2.1/2.

Morphometric characters: TL (mm)- 80.0-83.0; SL (mm)- 64.0-66.0; HL (mm)- 17.0-18.0. **% SL:** HL- 26.5-27.2; HD- 20.3-21.2; HW- 14.0-15.1; BDD- 30.3-31.2; BDA- 27.2-28.1; BWD- 13.6-14.0; BWA- 12.1-12.5; PRL- 59.0-59.3; POL- 40.9-42.1; PRPL- 45.3-46.9; PRA- 63.6-64.0; LD- 20.3-21.2; LP- 21.8-24.2; LV- 16.6-17.1; LA- 18.7-19.6; LC- 25.7-26.5; LBD- 21.2-21.8; LBA- 22.7-25.0; LCP- 12.5-13.6; DCP- 12.1-12.5; WCP- 6.0-6.2; DP-PL- 23.4-24.2; DPL-A- 19.6-20.3; DA-C- 34.8-35.9; DPV- 15.6-16.6; DAV- 4.5-4.6. **% HL:** HD- 72.2-76.4; HW- 50.0-52.9; ED- 33.3-35.2; IOW- 38.8-41.1; INW- 23.5-27.7; STL- 29.4-33.3; WGM- 23.5-27.7.

Other characteristics: Two pair of short barbels present. Fins yellow to deep orange- red; pectoral fins hyaline.

8. *Garra mullya* (Sykes, 1839) (Fig. 18)

Chondrostoma mullya Sykes, 1839. On the fishes of the Deccan. *Proc. Zool. Soc. Lond*., **6**:157–165 (Type locality: Deccan, India).

Diagnosis: Body and head somewhat flattened. A distinct black spot present just behind angle of operculum.

Meristic counts: D- ii, 8; P- i, 13-14; V- i, 8; A- ii, 5: C- iii, 17, iii; LLS- 31-33+1; PDS- 10; CPS- 7-8; LL/D- 4.1/2; LL/V- 3.1/2; LL/A- 4.1/2.

Morphometric characters:TL (mm)- 106.1-145.2; SL (mm)- 83.5-114.8; HL (mm)- 21.0-29.0. **% SL:** HL- 24.4-25.4; HD- 16.6-19.0; HW- 16.8-18.5; BDD- 22.8-26.1; BDA- 18.2-19.1; BWD- 16.5-18.8; BWA- 9.14-10.7; PRL- 45.7-48.3; POL- 56.7-59.2; PRPL- 51.3-52.8; PRA- 76.6-78.3; LD- 23.6-27.2; LP- 22.6-27.0; LV- 20.9-23.3; LA- 19.0-21.3; LC- 27.0-32.1; LBD- 16.1-18.5; LBA- 7.89-9.35; LCP- 16.5-17.5; DCP- 13.3-14.6; WCP- 5.98-6.94; DP-PL- 31.3-33.5; DPL-A- 25.8-27.5; DA-C- 19.1-22.2; DPV- 18.3-19.1; DAV- 6.96-9.01. **% HL:** HD- 65.8-73.0; HW- 66.2-73.1; ED- 28.6-33.4; IOW- 38.6-42.3; INW- 27.4-29.2; STL- 40.0-44.9; WGM- 44.8-48.6.

Other characteristics: Mouth small and inferior. Two pair of barbels present. A broad lateral band present on sides, bordered above and below by incomplete dark narrow lateral stripes.

9.*Haludaria faciata* (Jerdon, 1849)(Fig. 19)

Cirrhinus faciatus Jerdon,1849, *Madras Journal of Literature and Science,***15**: 305 (Type locality: Mundakkayam).

Diagnosis: Dorsal fin inserted equidistant between tip of snout and base of caudal fin; its last unbranched ray non- osseous and flexible. Body with three vertical black bands descending up to a little below lateral line.

Meristic counts: D- ii, 8; P- i, 13-14; V- i, 7; A- ii, 5: C- iii, 17, iii; LLS- 20; PDS- 8; CPS- 5-6; LL/D- 3.1/2; LL/V- 2.1/2-3.1/2; LL/A- 3.1/2.

Morphometric characters:TL (mm)- 68.0-69.0; SL (mm)- 52.0-53.0; HL (mm)- 16.0-18.0. **% SL:** HL- 30.7-33.9; HD- 30.1-30.7; HW- 18.8-19.2; BDD- 36.5-39.6; BDA- 25.0-26.4; BWD- 22.6-23.0; BWA- 13.2-13.4; PRL- 50.9-53.8; POL- 50.9-53.8; PRPL- 53.8-54.7; PRA- 76.9-79.2; LD- 26.4-28.8; LP- 24.5-25.0;

LV- 22.6-23.0; LA- 18.8-21.1; LC- 30.1-34.6; LBD- 20.7-23.0; LBA- 9.4-9.6; LCP- 15.0-15.3; DCP- 16.9-17.3; WCP- 9.4-9.6; DP-PL- 26.4-26.9; DPL-A- 25.0-26.4; DA-C- 22.6-26.9; DPV- 22.6-23.0; DAV- 1.9-3.7. **% HL:** HD- 88.8-100.0; HW-55.5-62.0; ED- 27.7-31.2; IOW- 38.8-43.7; INW- 22.2-31.2; STL- 38.8-43.7; WGM- 27.7-31.2.

Colour and other characters: Deep dull red or orange body. Fins pinkish, edged with black. Mouth moderate, sub-terminal and with two pair of barbels.

10.*Hypselobarbus curmuca* (Hamilton, 1807)(Fig. 20)

Cyprinus curmuca Francis Hamilton- Buchanan, 1807. *Journey in Mysore*, **3**: 344, (Type locality: Mysore, Western Ghats of India).

Diagnosis: Snout conical; a band of pores on cheeks. Last unbranched ray of dorsal fin is weak and smooth. Caudal fin with an oblique red band bordered with black.

Meristic counts: D- iii, 9; P- i, 14-15; V- i, 8-9; A- iii, 5: C- iii, 17, iii; LLS- 40-42+1; PDS- 12-14; CPS- 7-9; LL/D- 7.1/2-8.1/2; LL/V- 3.1/2-4.1/2; LL/A- 5.1/2.

Morphometric characters:TL (mm)- 170.0-199.6; SL (mm)- 131.4-158.0; HL (mm)- 37.5-42.3. **% SL:** HL- 26.7-28.9; HD- 17.9-19.3; HW- 14.2-15.6; BDD- 23.7-26.8; BDA- 17.0-18.3; BWD- 12.0-13.6; BWA- 6.20-8.09; PRL- 46.2-48.4; POL- 54.4-57.7; PRPL- 47.6-51.6; PRA- 72.2-76.1; LD- 23.2-25.5; LP- 19.6-21.3; LV- 16.9-18.2; LA- 16.6-18.9; LC- 29.3-32.4; LBD- 14.2-15.8; LBA- 7.76-8.41; LCP- 16.6-18.2; DCP- 10.1-10.8; WCP- 5.28-5.93; DP-PL- 23.8-27.0; DPL-A- 24.2-27.0; DA-C- 19.5-22.9; DPV- 21.0-23.6; DAV- 2.42-3.25. **% HL:** HD- 64.3-68.1; HW- 50.0-56.9; ED- 33.9-37.3; IOW- 34.4-37.1; INW- 21.7-23.3; STL- 37.1-39.8; WGM- 20.1-26.0.

Other characteristics: Two pairs of barbels present. Body is silvery or yellowish on flanks. Fins are slightly orange coloured.

11.*Hypselobarbus nitidus* (Plamoottil &Vineeth, 2022) (Fig. 21)

Hypselobarbus nitidus Plamoottil&Vineeth 2022, *Egyptian Journal of Aquatic Biology and Fisheries*, 26(2): 511 – 528.

Diagnosis: Non-osseous, weak and flexible last simple dorsal fin ray, 9 branched rays in ventral fin, red colored dorsal, ventral, anal and caudal fins and black tipped dorsal and upper caudal lobes.

Meristic counts: D- ii, 9; P- i, 14-15; V- i, 9; A- ii- iii, 5: C- iii, 17, iii; LLS- 29-31+1; PDS- 11-12; CPS- 5-6; LL/D- 5.1/2-6.1/2; LL/V- 3.1/2; LL/A- 4.1/2.

Morphometric characters: TL (mm)- 105.0-160.0; SL (mm)- 78.0-122.0; HL (mm)- 20.0-32.0. **% SL:** HL- 25.2-26.9; HD- 20.3-23.0; HW- 15.5-18.2; BDD- 33.0-37.7; BDA- 21.8-24.4; BWD- 16.6-18.2; BWA- 8.97-11.3; PRL- 47.8-52.4; POL- 53.8-57.3; PRPL- 53.0-56.4; PRA- 77.3-81.9; LD- 28.1-30.8; LP- 20.2-22.3; LV- 21.2-23.0; LA- 20.2-22.3; LC- 34.4-38.4; LBD- 16.6-17.4; LBA- 8.73-9.61; LCP- 13.5-18.0; DCP- 11.6-14.1; WCP- 4.75-6.55; DP-PL- 24.5-31.4; DPL-A- 26.9-28.2; DA-C- 20.1-21.7; DPV- 23.4-24.5; DAV- 2.38-3.84. **% HL:** HD- 80.7-85.7; HW- 61.5-67.8; ED- 30.7-45.0; IOW- 37.5-39.2; INW- 25.0-27.5; STL- 27.5-37.5; WGM- 25.0-30.0.

Other characteristics: Body deep and laterally compressed. Pelvic fin, anal fin, caudal fin and proximal half of dorsal fin reddish; distal half of both dorsal fin and upper caudal lobe deep black.

12.*Labeo rohita* (Hamilton, 1822)(Fig. 22)

Cyprinus rohita Francis Hamilton, 1822, *Fishes of Ganges*.: **301**: 388 (Type locality: Gangetic provinces).

Diagnosis: A pair of barbels present which are concealed in the lateral groove. Lateral line complete with 41 scales. Scales are with a red lunule.

Meristic counts: D- ii, 11-12; P- i, 16; V- i, 8; A- ii, 5: C- iii, 17, iii; LLS- 41; PDS- 14; CPS- 10; LL/D- 7.1/2; LL/V- 6.1/2; LL/A- 6.1/2.

Morphometric characters: TL (mm)- 166.0; SL (mm)- 133.0; HL (mm)- 36.0-37.0. **% SL:** HL- 27.0-27.8; HD- 20.3-21.0; HW- 16.5-17.2; BDD- 27.8-28.5; BDA- 17.2; BWD- 18.7; BWA- 11.2-12.0; PRL- 45.8-46.6; POL- 52.6-53.3; PRPL- 52.6-53.3; PRA- 77.4-78.1; LD- 21.0-21.8; LP- 18.0; LV- 16.5; LA- 17.2; LC- 27.0-27.8; LBD- 19.5-20.3; LBA- 6.0-6.7; LCP- 16.5; DCP- 12.0-12.7; WCP- 6.0; DP-PL- 28.5-30.0; DPL-A- 24.8-25.5; DA-C- 18.7-19.5; DPV- 21.0; DAV- 4.51. **% HL:** HD- 75.0-75.6; HW- 61.1-62.1; ED- 22.2-24.3; IOW- 47.2-51.3; INW- 36.1-37.8; STL- 38.8-40.5; WGM- 21.6-22.2.

Other characteristics: Snout fairly depressed; mouth inferior; lips thick and fringed. Caudal fin deeply forked.

13. *Labeo nigrescens* Day, 1870(Fig. 23)

Labeo nigresens Day, 1870, *Proc. Zool. Soc. Lond*: **371** (Type locality: Mangalore, Karnataka).

Diagnosis: Its dorsal and ventral profiles equally convex. Mouth sub-inferior; lower lip deeply fringed. Caudal fin deeply forked.

Meristic counts: D- iii, 15; P- i, 17; V- i, 8; A- ii, 5: C- iii, 17, iii; LLS- 41; PDS- 20; CPS- 9; LL/D- 7.1/2; LL/V- 4.1/2; LL/A- 5.1/2.

Morphometric characters: TL (mm)- 195.5; SL (mm)- 143.5; HL (mm)- 35. **% SL:** HL- 24.3; HD-18.1; HW- 16.0; BDD- 29.3; BDA- 23.3; BWD- 13.9; BWA- 9.47; PRL- 45.6; POL- 55.7; PRPL- 51.4; PRA- 74.9; LD- 45.9; LP- 25.0; LV- 30.3; LA- 31.7; LC- 37.2; LBD- 28.0; LBA- 9.47; LCP- 18.4; DCP- 15.4; WCP- 5.57; DP-PL- 29.6; DPL-A- 26.9; DA-C- 22.2; DPV- 20.6; DAV- 5.78. **% HL:** HD- 74.2; HW- 65.7; ED- 28.8; IOW- 48.5; INW- 37.1; STL- 40.0; WGM- 31.4.

Other characteristics: Last unbranched dorsal fin ray is soft and flexible. Eyes red coloured. Fins black.

14.*Sahyadria denisonii* (Day, 1865) (Fig. 24)

Labeo denisonii Day. 1865, *Proc. Zool. Soc. Lond*: **299**. (Type locality: Mundakkayam Kerala).

Diagnosis: Last unbranched ray of dorsal fin non- osseous, weak and flexible. A black lateral band present along the flanks; scarlet band borders this from snout tip up to below dorsal origin. Caudal fin with an oblique yellow, black mark and tipped with grey color.

Meristic counts: D- ii, 8; P- i, 12; V- i, 8; A- iii, 15: C- iii, 17, iii; LLS- 28; PDS- 8; CPS- 5; LL/D- 4.1/2; LL/V- 2.1/2; LL/A- 4.1/2.

Morphometric characters: TL (mm)- 120.2; SL (mm)- 94.0; HL (mm)- 23.1. **% SL:** HL- 24.5; HD-15.7; HW- 13.7; BDD- 26.7; BDA- 18.8; BWD- 13.7; BWA- 7.65; PRL- 45.7; POL- 56.5; PRPL- 51.7; PRA- 74.6; LD- 25.8; LP- 19.8; LV- 18.0; LA- 15.9; LC- 32.6; LBD- 16.4; LBA- 7.76; LCP- 20.2; DCP- 10.8; WCP- 6.38; DP-PL- 27.6; DPL-A- 25.0; DA-C- 22.3; DPV- 21.9; DAV- 3.08. **% HL:** HD- 64.0; HW- 55.8; ED- 37.6; IOW- 34.1; INW- 22.9; STL- 31.1; WGM- 22.5.

Other characteristics: Barbels are a pair of maxillaries. Dorsum greenish and belly silvery. Anterior two- three rays of dorsal fin stained with scarlet color.

15.*Puntius ocellus* Plamoottil &Vineeth, 2020 .(Fig. 25)

Puntius ocellus Plamoottil &Vineeth, 2020, *Egypt. Acad. J. Biolog. Sci*., **12** (2): 101-110. (Type locality: Kasargod, Kerala)

Diagnosis: A large deep black round spot present on posterior most lateral line scales and a distinct golden or yellow ring encircling it. Snout is pointed and elongated.

Meristic counts: D- ii, 8; P- i, 13-14; V- i, 8; A- ii, 5: C- iii, 17, iii; LLS- 23-24+1; PDS- 7-8; CPS- 5-6; LL/D- 4.1/2; LL/V- 2.1/2; LL/A- 3.1/2.

Morphometric characters:TL (mm)- 75.0-91.0; SL (mm)- 60.0-73.5; HL (mm)- 18.5-22.5. **% SL:** HL- 29.7-30.8; HD- 20.6-22.4; HW- 15.9-17.5; BDD- 29.8-32.1; BDA- 21.0-22.3; BWD- 15.0-17.1; BWA- 9.52-10.4; PRL- 46.6-51.5; POL- 53.9-55.2; PRPL- 50.7-55.0; PRA- 73.9-77.7; LD- 26.0-28.3; LP- 19.5-20.8; LV- 18.4-20.1; LA- 17.3-19.1; LC- 28.9-30.8; LBD- 14.4-17.1; LBA- 7.97-10.0; LCP- 14.9-20.5; DCP- 13.0-13.6; WCP- 4.47-5.07; DP-PL- 21.7-26.9; DPL-A- 23.1-26.2; DA-C- 21.0-23.3; DPV- 21.0-23.1; DAV- 1.58-2.45. **% HL:** HD- 68.4-72.5; HW- 53.3-57.5; ED- 33.3-37.5; IOW- 31.5-35.5; INW- 21.0-24.4; STL- 32.5-35.1; WGM- 23.6-30.0.

Other characteristics: One pair of small and feeble maxillary barbels, shorter than orbit. No osseous rays in dorsal fin. Scales moderate, soft and easily deciduous.

16.*Puntius vittatus* Day, 1865(Fig. 26)

Puntius vittatus Day, 1865, *Proc. Zool. Soc. Lond*.: **303** (Type locality- Cochin Kerala).

Diagnosis: Last unbranched ray of dorsal fin is weak and smooth. Lateral line incomplete and extends up to 7th scale; an elongated black bar present on dorsal fin.

Meristic counts: D- ii,8; P- i,8; V- i,8; A- ii,5: C- iii,17,iii; LLS- 21; PDS- 8; CPS- 5; LL/D- 3.1/2; LL/V- 2.1/2; LL/A- 2.1/2.

Morphometric characters:TL (mm)- 37.0-42.0; SL (mm)- 27.0-32.0; HL (mm)- 9.0-10.0. **% SL:** HL- 30.0-33.3; HD- 20.0-22.2; HW- 15.6-18.5; BDD- 33.3-34.3; BDA- 22.2-25.0; BWD- 15.6-18.5; BWA- 10.0-12.5; PRL- 50.0-51.8; POL- 51.8-56.6; PRPL- 48.3-51.8; PRA- 68.7-74.7; LD- 31.2-33.3; LP- 18.5-21.8; LV- 22.2-25.0; LA- 18.7-22.2; LC- 34.3-38.7; LBD- 14.8-16.6; LBA- 6.45-9.37; LCP- 25.0-25.9; DCP- 14.8-16.6; WCP- 6.25-7.40; DP-PL- 18.5-20.0; DPL-A- 21.8-25.9; DA-C- 28.1-30.0; DPV- 18.7-22.2; DAV- 3.12-3.70. **% HL:** HD- 60.0-66.6; HW- 50.0-55.5; ED- 33.3-40.0; IOW- 30.0-33.3; INW- 30.0-33.3; STL- 20.0-22.2; WGM- 20.0-22.2.

Other characteristics: Barbels absent. A black blotch occurs on the base of caudal peduncle.

17.*Rasbora dandia* (Valenciennes, 1844) (Fig. 27)

Leuciscus dandia Valenciennes, 1844, Histoire Naturelle Des Poissons. Cuvier, M.L.E.B. &Valenciennes, M.A.(1844) : 305.

Diagnosis: Mouth obliquely directed upwards. Dorsal fin located nearer to caudal fin than snout tip. A gold bordered dark lateral band runs from snout to the base of caudal fin.

Meristic counts: D- ii, 7; P- i, 12; V- i, 8; A- ii, 5: C- iii, 17, iii; LLS- 32; PDS- 12-13; CPS- 6; LL/D- 5.1/2; LL/V- 2.1/2; LL/A- 2.1/2.

Morphometric characters:TL (mm)- 108.0-114.0; SL (mm)- 81.0-91.0; HL (mm)- 23.0-25.0. **% SL:** HL- 27.4-28.3; HD- 16.4-20.9; HW- 16.0-16.4; BDD- 21.9-28.3; BDA- 18.6-20.9; BWD- 16.4-17.2; BWA- 10.9-12.3; PRL- 51.6-58.0; POL- 43.9-45.6; PRPL- 51.6-51.8; PRA- 73.6-76.5; LD- 21.9-24.6; LP- 18.6-22.2; LV- 15.3-17.2; LA- 17.5-19.7; LC- 26.3-33.3; LBD- 12.0-13.5; LBA- 9.8; LCP- 16.4-22.2; DCP- 13.1-14.8; WCP- 5.4-7.4; DP-PL- 27.1-27.4; DPL-A- 24.1-25.9; DA-C- 25.9-27.7; DPV- 20.8-23.4; DAV- 2.4-3.2. **% HL:** HD- 60.0-73.9; HW- 56.5-60.0; ED- 28.0-30.4; IOW- 43.4-44.0; INW- 28.0-30.4; STL- 34.7-36.0; WGM- 32.0-34.7.

Other characteristics: Barbels absent. Dorsal fin inserted behind origin of pelvic fins.

18.*Salmostoma boopis* (Day, 1874)(Fig. 28)

*Chela boopis*Day, 1874, *Proc. Zool. Soc. Land*: **708**. (Type locality: South Canara).

Diagnosis: Dorsal fin inserted anterior to anal fin. Scales large: lateral line slightly curved, with 39-41 scales.

Meristic counts: D- ii, 7-8; P- i, 12-13; V- i, 8; A- ii-iii, 13: C- iii, 17, iii; LLS- 38-40+1; PDS- 21-23; CPS- 5-6; LL/D- 6.1/2; LL/V- 1.1/2; LL/A- 2.1/2.

Morphometric characters:TL (mm)- 81.0-119.0; SL (mm)- 64.0-95.0; HL (mm)- 16.0-22.5. **% SL:** HL- 23.6-24.1; HD- 15.7-17.1; HW- 11.5-11.7; BDD- 22.0-22.6; BDA- 20.0-20.6; BWD- 9.47-10.0; BWA- 6.84-8.59; PRL- 64.2-64.8; POL- 35.8-37.5; PRPL- 51.5-51.7; PRA- 69.5-70.5; LD- 15.7-18.7; LP- 25.5-26.5; LV- 14.7-15.6; LA- 13.6-15.6; LC- 27.5-29.6; LBD- 9.47-10.9; LBA- 15.1-16.8; LCP- 15.1-16.8; DCP- 8.42-9.65; WCP- 4.13-4.68; DP-PL- 26.5-27.5; DPL-A- 18.7-22.6; DA-C- 26.5-27.5; DPV- 17.1-21.0; DAV- 1.37-1.57. **% HL:** HD- 65.7-68.7; HW- 46.8-48.8; ED- 43.7-45.7; IOW- 31.2-34.2; INW- 18.7-20.0; STL- 25.0-26.6; WGM- 21.8-22.8.

Other characteristics: Body slender, elongated and compressed. Belly more convex than dorsum. Barbels absent. Body silvery in life with a golden yellow lateral band. Dorsal, anal and caudal fins tipped black.

19.*Tor khudree* (Sykes, 1839)(Fig. 29)

Barbus khudree Sykes, 1839, On the fishes of the Deccan. Proc. Zool. Soc.Lond., **6**:157–165(Type locality: Deccan, India).

Diagnosis: last unbranched ray of the dorsal fin is osseous, strong and smooth. Lateral line with 24 scales; barbels two pairs.

Meristic counts: D- iii, 8; P- i, 13; V- i, 8; A- ii, 5: C- iii, 17, iii; LLS- 24; PDS- 8; CPS- 5; LL/D- 4.1/2; LL/V- 2.1/2; LL/A- 3.1/2.

Morphometric characters:TL (mm)- 82.0; SL (mm)- 66.0; HL (mm)- 21.0. **% SL:** HL- 31.8; HD-24.2; HW- 18.1; BDD- 28.7; BDA- 19.6; BWD- 16.6; BWA- 12.1; PRL- 48.4; POL- 54.5; PRPL- 51.5; PRA- 72.7; LD- 28.7; LP- 21.2; LV- 19.6; LA- 21.2; LC- 28.7; LBD- 16.6; LBA- 7.57; LCP- 21.2; DCP- 13.6; WCP- 6.06; DP-PL- 22.7; DPL-A- 22.7; DA-C- 28.7; DPV- 19.6; DAV- 3.0. **% HL:** HD- 76.1; HW- 57.1; ED- 28.5; IOW- 33.3; INW- 23.8; STL- 33.3; WGM- 23.8.

Other characteristics: Mouth moderate and sub terminal. Bases of scales dark; fins grey; often tipped with yellow.

20.*Systomus subnasutus* (Valenciennes, 1842)(Fig. 30)

*Barbus subnasutus*Valenciennes, 1842, *Hist. nat. Poiss.*,**16**: 154. (Type locality: Pondicherry).

Diagnosis: Last unbranched ray of dorsal fin strong, osseous and posteriorly serrated. A dark band present behind operculum and black blotch on lateral line on about 24th scale.

Meristic counts: D- iii, 8; P- i, 14; V- i, 8; A- ii, 15: C- iii, 17, iii; LLS- 30; PDS- 11; CPS- 8; LL/D- 6.1/2; LL/V- 5.1/2; LL/A- 4.1/2.

Morphometric characters:TL (mm)- 187.0-193.0; SL (mm)- 147.0-148.0; HL (mm)- 43.0. **% SL:** HL- 29.0-29.2; HD- 24.4-26.3; HW- 19.5-20.4; BDD- 35.1-36.7; BDA- 25.0-25.1; BWD- 20.9-21.7; BWA- 12.8-14.2; PRL- 53.3-54.4; POL- 48.9-51.3; PRPL- 50.0-50.3; PRA- 75.6-77.5; LD- 26.5-27.0; LP- 19.0-20.9; LV- 18.2-18.3; LA- 17.5-18.3; LC- 30.4-30.6; LBD- 15.6-16.2; LBA- 9.5-10.1; LCP- 17.6-18.9; DCP- 14.8-15.6; WCP- 7.4-8.1; DP-PL- 25.1-25.6; DPL-A- 27.0-27.2; DA-C- 27.0-27.2; DPV- 23.1-24.3; DAV- 3.3-4.0. **% HL:** HD- 83.7-90.6; HW- 67.4-69.7; ED- 25.5; IOW- 44.1-46.5; INW- 23.2-25.5; STL- 27.9-32.5; WGM- 27.9-41.8.

Other characteristics: Body fairly deep. Two pair of barbels present. Dorsal and caudal fins dark stained.

Table (2): Nomenclatural details of cyprinid fishes collected from Kasargod district

No.	Scientific name	Regional name	Common name	Synonyms
1	*Barilius ardens*	Poovalchi; Paavukan	Nil	Nil
2	*Barilius canarensis*	Poovalchi; Paavukan; Velinjil; Paraloli	Jerdon's Baril	*Opsarius canarensis* Jerdon, 1849
3	*Barilius cyanochlorus*	Poovalchi; Paavukan; Velinjil; Paraloli	Bluegreen Baril	Nil
4	*Barilius malabaricus*	Poovalchi; Paavukan; Velinjil; Paraloli	Poovalchi; Paavukan	*Opsarius malabaricus* Jerdon, 1849
5	*Dawkinsia assimilis*	Pulliparal; Poovalipartal	Mascara or Assimilis Barb	*Systomus assimilis* Jerdon, 1849; *Puntius assimilis* (Jerdon, 1849); *Puntius lepidus* Day, 1868
6	*Dawkinsia filamentosa*	Pulliparal; Poovalipartal	Indian Tiger barb	*Puntius filamentosa*
7	*Devario malabaricus*	Ozhukkilatti; Thuppalkothi	Malabar Danio	*Perilampus malabaricus* (Jerdon, 1849); *Perilampus canarensis* (Jerdon, 1849) *D. malabaricus* (Jerdon , 1849)
8	*Garra mullya*	Kallotti; Kallemutti	Mullya Garra	*Chondrostoma mullya* *Garra malabarica*
9	*Haludaria fasciata*	Vazhakkaparal	Melon Barb	*Cirrhinus fasciatus* Jerdon, 1849; *Labeo melanampyx* Day, 1865; *Puntius* (*Barbodes*) *grayi* Day, 1867
10	*Hypselobarbus curmuca*	Kooral	Curmuca Barb	*Gonoproktopterus curmuca*
11	*Hypselobarbus nitidus*	chemvaalan	Kerala Beauty	Nil
12	*Labeo rohita*	Rohu;Rogu	Rohu	*Cyprinusrohita*Hamilton, 1822*Rohitabuchanani*Valenciennes, 1842
13	*Labeo nigrescens*	Karuthameen	Black Labeo	Nil
14	*Sahyadria denisonii*(Day)	Chenganiyan; Chorakaniyan	Denison's Barb	*Puntius denisoni*(F. Day, 1865)
15	*Puntius ocellus*	Paral	Double eyed Barb	Nil
16	*Puntius vittatus*	Podipparal	Green Stripe Barb; Kooli barb	*Barbus vittatus (*Day, 1865)
17	*Rasbora dandia*	Kanangon; ThuppalKothi	Common Rasbora	*Leuciscus dandia* Valenciennes, 1844 *Rasbora caverii* Jerdon, 1849
18	*Salmostoma boopis*	Mathiparal; KathiParal	Razor Belly Minnow	*Chela boopis* Day, 1874; *Oxygaster boopis* (Day, 1874); *Salmophasia boopis* (Day, 1874)
19	*Tor khudree*	Katti	Khudree mahseer, Black mahseer	*Barbus khudree* Sykes, 1839 *Puntius khudree* (Sykes, 1839)
20	*Systomus subnasutus*	Kuruva	Penninsular olive Barb	*Barbus subnasutus* Valenciennes, 1842 *Puntius subnasutus* (Valenciennes, 1842)

Fig. 11. *Barilius ardens*

Fig. 12.*Barilius canarensis*

Fig. 13. *Barilius cyanochlorus*

Fig. 14. *Barilius malabaricus*

Fig. 15. *Dawkinsia assimilis*

Fig. 16.*Dawkinsia filamentosa*

Fig. 17.*Devario malabaricus*

Fig. 18.*Garra mullya*

Fig. 19. *Haludaria faciata*

Fig. 20.*Hypselobarbus curmuca*

Fig. 21.*Hypselobarbus nitidus*

Fig. 22.*Labeo rohita*

Fig. 23.*Labeo nigresens*

Fig. 24.*Sahyadria denisonii*

Fig. 25.*Puntius ocellus*

Fig. 26.*Puntius vittatus*

Fig. 27.*Rasbora dandia*

Fig. 28.*Salmostoma boopis*

Fig. 29.*Tor khudree*

Fig. 30. *Systomus subnasutus*

CONCLUSION

Rivers of Kasargod district are characterized by the presence of both salt water and freshwater fishes; estuarine fishes preponderate in many areas. Systematic studies conducted on both these groups of fishes in the district are rare. Of the 20 species of fishes collected during the present study, 3 were new to science, described and scientifically named during this research work. Four *Barilius* species were collected; of these, *B. malabaricus* and *B.canarensis* are rare cyprinds restricted in its distribution in water bodies of northern Kerala. *Labeo nigrescens* is very rare and not procured from any aquatic bodies after its original description by **Day (1870)**. *Tor khudree* and *Puntiusv ittatus* shows many variations to its original description; therefore, it has to be compared with the specimens collected from their type localities. *Labeo rohita* collected during this study also exhibits marked differences from the original *Rohita* of west Bengal; more studies are required to prove its

identity. Taking measurements with more meristic and morphometric characters will surely be helpful in the correct identification of fish species; the more variables we are taking, the more chance for the discovery of new taxa; therefore, more basic level classical taxonomic studies must be encouraged in the scientific world; it is expected that more systematic studies may be conducted on cyprinid fishes of the state in days to come.

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