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## A report on *Pterygoplichthys pardalis* Amazon sailfin suckermouth Catfishes in Freshwater tanks at Telangana state, India

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### Abstract

A report on the occurrence of Amazon suckermouth armoured catfish *Pterygoplichthys pardalis* (Castelnau, 1855) from the native freshwater tanks at Jangaon, Telangana State, India. The sailfin catfish belonging to the genus *Pterygoplichthys* of the Loricariidae family has been introduced to tropical and subtropical freshwater environments. The study was conducted for fish taxonomic identification and behaviour in the laboratory condition. This study was conformed and given information on this invasive species of *P. pardalis* was dug out the bottom of the soil. Ten meristic and 43 morphometric characteristics were reported in this study for identification of species. This species is radiating pattern of light lines on the head, leopard body ornamentation on the dorsal side, the ventral sucker mouth is triangular, three lips contains  $16 + 16 + 32$  (two groups) 0.13 mm length of tubular filamented teeth and more number of tubercles are present around the mouth.

**Keywords:** *Pterygoplichthys pardalis*, sailfin sucker mouth catfishes, meristic, morphometric, freshwater tanks

### 1. Introduction

*P. pardalis* is native to the Amazon River Basin of Brazil and Peru [1]. It is one of a number of species commonly referred to as the common pleco or "leopard pleco" by aquarists [2]. Although normally a bottom-dwelling fish, they have the ability to breathe air from the surface of the water during dry periods and those in which dissolved oxygen is too low [3]. The family Loricariidae includes catfish generally referred to as "Plecs" that are widespread throughout South America [2]. Though the majority of the species available are from wild, these are also being bred through commercial breeding farms for the aquarium trade [4]. As the reason they are often hybridized among stocks for better varieties, hence, the identity of individual species is always uncertain [5, 6].

The sailfin catfish belonging to the genus *Pterygoplichthys* of the Loricariidae family has been widely introduced to tropical and subtropical freshwater environments worldwide [7]. It caused serious ecological impacts. The sailfin catfish are among one of the exotic fish groups most seriously threatening tropical and subtropical freshwater regions have been introduced all around the world from South America by the aquarium trade [8]. Nevertheless, occasional escapes due to carelessness of owners provided a chance for these fish to establish populations in tropical and subtropical freshwater bodies. South American suckermouth armoured catfishes (Loricariidae), are popular throughout the world as aquarium pets because of their characteristic attractive appearance and „use“ in aquarium as a „cleaner“ to remove the algae [9]. The genus *Pterygoplichthys* is one of the fast dispersing species in the invaded countries, introduced primarily through uncontrolled pet trade and their invasion results in serious ecological and economic consequences [10]. This study established the invasion of *P. Pardalis*, *P. disjunctivus* and their intermediates in this lake. *P. pardalis* is native to the Amazon River Basin of Brazil and Peru. Although normally a bottom-dwelling fish, they have the ability to breathe air from the surface of the water during dry periods and those in which dissolved oxygen is too low. There is also an albino color variation of this species, usually referred to as an "Albino Plecostomus". Synonyms are *Hypostomus pardalis*, *Liposarcus pardalis*, *Liposarcus varius* and *Liposarcus jeansianus*.

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The present study period the species spread gradually in local freshwater bodies and reservoirs, which are threat to other local fish species.



Fig 1: Kundaram Cheruvu (Google courtesy)

**2. Materials and Methods**

Fishes were collected from Kundaram village cheruvu (Freshwater tank) and water spread area is 20 hectares, at Jangaon district (Fig 1), during a fish catch of freshwater tanks, observed a few fishes morphologically similar to the suckermouth armoured catfish of Loricariidae family, among the catches of local fishers. Samples were collected using long line (Muuduvelu vala) [11] during night time. The specimens were collected and brought to the Laboratory with live condition to Govt. Degree & PG College, Jammikunta, for taxonomic identification. Previously published descriptions of species of morphometric data were used to make comparison with the newly collected specimens. Specimens were identified based on the keys provided by Weber and Armbruster [12, 13, 14]. The fishes maintained live in Zoology laboratory and kept in cement tank with 8cm height paper bed provided for detailed studies. Morphometric measurements were taken with scale and weight to the nearest milligram (mg) using a digital balance. Forty three morphometric and ten meristic characters of the specimens were examined, following the methods suggested by Armbruster, Ambruster & Page [15, 16, 17, 18]. Names of the plate rows were followed by Schaefer [19]. The morphological identification was done in accordance with the keys of Armbruster, Armbruster & Page and Page & Robins [14, 16, 18, 20].

**3. Results**

The examination of specimens of both male and female fishes based on colouration, morphometric and meristic characters (Tables 1 and 2) revealed that the presence of species *Pterygoplichthys pardalis* (Castelnau, 1855) (Images 2). The scientific classification of *Pterygoplichthys pardalis* is provided in Table 3. Many synonyms were used for *Pterygoplichthys pardalis* as *Hypostomus pardalis*, *Liposarcus pardalis*, *Liposarcus varius*, and *Liposarcus jeansianus*.

**Table 1:** Morphometric characteristics of *Pterygoplichthys pardalis*

S. No	Morphometric characteristics	mm
1	Total length (TL)	182
2	Standard length (SL)	154
3	Head length (HL)	40
4	Head dorsal length (HDL)	44
5	Head pectoral length (HPL)	37
6	Thorax length (THL)	16
7	Pectoral spine length (PCSL)	45
8	Abdominal length (AL)	58
9	Pelvic spine length (PESL)	28
10	Anal fin spine length (AFSL)	26
11	Dorsal pectoral distance (DPCD)	25
12	Dorsal spine length (DSL)	09
13	Dorsal pelvic distance (DPED)	26
14	Dorsal fin base length (DFBL)	51
15	Dorsal adipose distance (DAD)	06
16	Adipose spine length (ASL)	09
17	Dorsal adipose caudal distance (DACD)	11
18	Caudal peduncle distance (CPD)	12
19	Adipose anal distance (AAD)	31
20	Dorsal anal distance (DAND)	54
21	Pre-anal distance (PRAD)	56
22	Length of first caudal fin ray (LFCFR)	52
23	Length of last caudal fin ray (LLCFR)	39
24	Head eye length (HEL)	21
25	Orbit diameter (OD)	06
26	Snout length (SNL)	15
27	Inter nares width (INW)	08
28	Interorbital width (IOW)	21
29	Head depth (HD)	29
30	Body depth (BD)	29
31	Mouth length (ML)	15
32	Mouth width (MW)	18
33	Barbel length (BL)	06
34	Dentary tooth cup length (DTCL)	01
35	Premaxillary tooth cup length (PTCL)	01
36	Gill arch length	17
37	Snout to mouth distance	17
38	Snout to pectoral distance	26
39	Mouth to pectoral distance	22
40	Snout to caudal fin distance	136
41	Snout to anal fin distance	95
42	Anus to caudal fin distance	61
43	Anus to anal fin distance	05

**Table 2:** Meristic characteristics of *Pterygoplichthys pardalis*

S. No	Meristic characteristics	Count
1	Dorsal fin spines (DFS)	XII
2	Anal fin rays (AFR)	I+3
3	Caudal fin rays (CFR)	16
4	Pectoral fin rays (PCFR)	I+5
5	Pelvic fin rays (PLFR)	I+5
6	First ventral line bony plates spines	27
7	Second ventral line bony plates spines	31
8	Third ventral line bony plates spines	29
9	Fourth ventral line bony plates spines	28
10	Fifth ventral line bony plates spines	23

**Table 3:** Scientific classification of studied species, *Pterygoplichthys pardalis*

Scientific	Classification
Kingdom:	Animalia
Phylum:	Chordata
Subphylum :	Vertebrata
Superclass:	Osteichthyes
Class:	Actinopterygii
Subclass:	Neopterygii
Infraclass:	Teleostei
Superorder:	Ostariophysi
Superorder:	Ostariophysi
Family:	Loricariidae
Subfamily:	Hypostominae (Armored catfishes)
Genus:	<i>Pterygoplichthys</i>
Species:	<i>P. pardalis</i> (Amazon sailfin catfish)
IUCN:	Vulnerable (VU)

*Pterygoplichthys pardalis* was characterized by radiating pattern of light lines on the head and hexagonal leopard patches on the body (Fig 3). The ventral sucker mouth is triangular and contains 16 + 16+ 32 (two groups) of 0.13 mm length of smooth filamented tubular denticles and more number of tubercles are present around the three lips, which is helped to attached to the smooth surface (Fig 4). The abdomen consists of dark markings on light background, a flat-bottom body and uncoalesced dark spots on a light background (Fig 5). The body and edge of the snout covered with bony plates. Post dorsal ridge inconspicuous, a pair of subterminal dark barbells (Fig 6), usually a spine in front of the adipose fin, ventral surface of the pectoral girdle covered in skin mesial to the coracoid strut (Fig 7). In the present investigation made observations the male fish was dig the holes at bottom of the tank (Fig: 8). The caudal peduncle round and sucking lips present (Fig 9). Information on the assumed presence of this invasive species based on sightings of a hitherto unknown species by local people and fishermen in local tanks and it has been confirmed by the present study.

During the study period ten meristic and forty three morphometric characteristics were reported. Head exhibit linear patterns forming geometric shape and contain numerous tubercles with small spines and rough its touches (Fig 10 and 14). Crescent shaped gill arch present above the pectoral fin and one pair of barbells at anterior mouth (Fig 6 and 11). Eye balls move up and down approximately 0.3mm depth at rest (Fig 10).The ventral side of the body is smooth and ornamentation upto anal fin after that it is covered with bony plates with spines (Fig 5). The lateral side covered with large bony plates with spines in five rows, the first line (27 bony plates) and second line (31bony plates) origin from below head region both connected like 'V' shape, the third line (29 bony plates) and fourth line (28 bony plates) origin from below the pelvic girdle and the fifth line (23 bony plates) origin from pelvic girdle (Fig 13). The five lines reached to caudal region of the peduncle base. The first dorsal fin contains 12 numbers of spines and second dorsal is adipose. Pelvic fin touches middle of the pectoral fin, middle of the dorsal fin and seventh bony plate of 4<sup>th</sup> line. Pelvic fins touches to anus and anal fin extended upto below the adipose fin.

YouTube video can watch this link <https://www.youtube.com/watch?v=oBQFOsJZuEs> karri. Rama Rao Published on Feb 22<sup>nd</sup> 2017.



**Fig 2:** Male and Female *P. pardalis*



**Fig 3:** Lateral view of *P. pardalis*



**Fig 4:** Teeth on upper and lower lips of *P. pardalis*.



**Fig 5:** Ventral view of male *P. pardalis*



**Fig 6:** Gill arch and barbels of *P. pardalis*.



**Fig 10:** Depressed eye ball of *P. pardalis*.



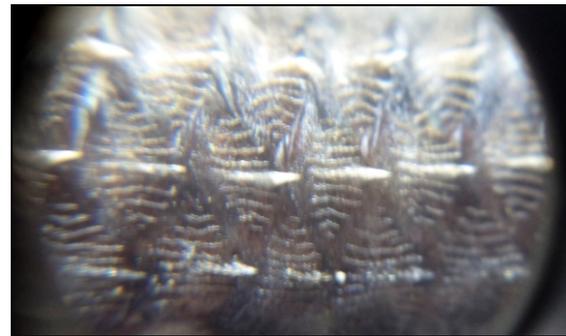
**Fig 7:** Pectoral spine and eye of *P. pardalis*.



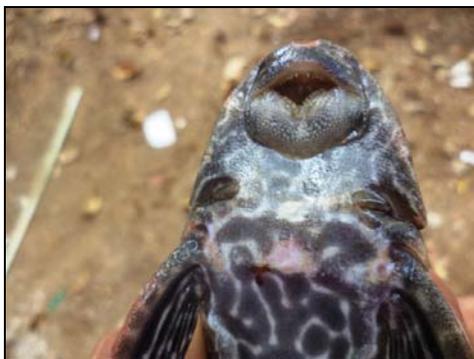
**Fig 11:** Lateral view for gill arch of *P. pardalis*.



**Fig 8:** Male fish dwelling hole at tank bottom.



**Fig 12:** Bony plates with spines of *P. pardalis*.



**Fig 9:** Triangular mouth with denticles of *P. pardalis*.



**Fig 13:** Lateral line and spiny plates of *P. pardalis*.



**Fig 14:** Tubercles on head region of *P. pardalis*.

#### 4. Discussion

The present specimens were classified based on the two species similar morphometric measurements and show slight variations from the range of measurements given by Weber [12]. Bijukumar *et al.* [21] reported invasion of South American sucker mouth armoured catfishes *Pterygoplichthys* spp. from drainages of Tiruvantapuram city, Kerala. Further the species delineation within the genus *Pterygoplichthys* remains in chaos primarily because the four closely related species such as *P. anisitsi*, *P. multiradiatus*, *P. pardalis* and *P. disjunctivus* are separated only based on the nature of their abdominal patterns reported by Nico *et al.* [10]. The similar characters were reported by Page and Burr [22] and Page and Robins [4]. A large fish with dark body colouration with a reticulated pattern can be confused with *Pterygoplichthys disjunctivus*, but the *P. pardalis* has a spotted pattern on the abdomen whereas the *P. disjunctivus* has a vermiculated pattern. The dorsal is tall and there are two spiny ridges running down the flanks of the fish from the pectoral fins, these can cause the fish to get tangled in nets or even burst fish bags. Weber [5, 6] assigned sailfin catfishes to three genera and used the name *Liposarcus pardalis* for this species. Armbruster [17], after a detailed systematic review, placed the genus *Liposarcus* into the synonymy of *Pterygoplichthys*. Weber [12] provided a key and distinguishing characteristics and photographs of specimens; Armbruster and Page [14] present a revised key to species in the genus *Pterygoplichthys* (except *P. ambrosetti*).

In this genus 150 species were reported in America, out of these four species were invaded in Indian inland waters. Four species of the suckermouth armoured catfishes were reported in six states from India during 2006 to 2014. *Pterygoplichthys pardalis* is reported from four states from Coastal Andhra Pradesh, West Bengal, Bihar and Uttar Pradesh [23]. The suckermouth armoured catfishes reported from India include *Pterygoplichthys anisitsi* from Bihar [24], *P. multiradiatus* from Kerala and Tamil Nadu [6, 25, 26, 27], *Pterygoplichthys disjunctivus* and *P. pardalis* from Andhra Pradesh, West Bengal, Bihar and Uttar Pradesh [23, 24].

In the present investigation the male fish was dig the holes at bottom of the tank the similar studies made observed in male members of the genus *Pterygoplichthys* dug out river banks to create burrows in which an attracted female will lay and guard her eggs. In large numbers, this burrowing behavior by *Pterygoplichthys* contributes to problems with siltation. In addition, the burrows potentially destabilize the banks, leading to an increased rate of erosion [28]. *Pterygoplichthys disjunctivus* and *P. pardalis* are reportedly destroying cages and nets and causing a decline in native, more desirable fish in Laguna de Bay, Philippines [29]. *P. disjunctivus* attaches to the skin of the 'Endangered (EN)' native Florida manatee (see *Trichechus manatus* ssp. *latirostris*) and feeds on their epibiota. In some instances dozens of *P. disjunctivus* and manatees appeared agitated. This interaction may be detrimental to manatee but remains unclear [28]. *H. plecostomus* the male fish was dig the holes at bottom of the tank the similar studies made observed in male members of the genus *Pterygoplichthys* dug out river banks to create burrows in which an attracted female will lay and guard her eggs. In large numbers, this burrowing behavior by *Pterygoplichthys* contributes to problems with siltation [30-31].

#### 5. Conclusion

This paper documents that the invasion of *Pterygoplichthys pardalis* in the local freshwater tanks of Jangaon, Waranga and Karimnagar Districts of Telangana State and faced identification of the invaded species. This fish species may spread from aquarists and through fish seed from other states of India. The ecological impacts upon introduction of this species to the aquatic habitat are disruption of food chain by overgrazing of benthic algae and competing with native species. The burrowing habitat clearly indicated and disrupting benthic communities to damaging the banks. The fish can damage to the fishermen long lines during night fishing. The State Government of Telangana takes necessary action to eradicate of this invaded fish species.

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