



NEW RECORDS OF THE ENDANGERED BALITORID LOACH, *TRAVANCORIA ELONGATA* PETHIYAGODA & KOTTELAT 1994, FROM THE KERALA PART OF THE WESTERN GHATS, INDIA

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The superfamily Cobitoidea comprises around 1043 valid species of small benthic hill stream fishes found in Eurasia and parts of Africa (Kottelat 2012). These fishes have highly divergent life histories, and are of interest to both the aquarium trade as well as aquaculture (Liu et al. 2012). However, they do not generally constitute a very

conspicuous part of biodiversity because they are small and mostly hide among stones and organic debris (Kottelat 1998; MRC 2010).

Recent phylogenetic studies have suggested that Cobitoidea consist of five monophyletic families: Balitoridae, Nemacheilidae, Cobitidae, Vaillantellidae, and Botiidae (Liu et al. 2012).

Family Balitoridae Swainson, 1839, constitutes an important part of the ichthyofauna of the Western Ghats with around 10 genera (*Balitora*, *Bhavana*, *Homaloptera*, *Indoreonectes*, *Longischistura*, *Mesonoemacheilus*, *Nemacheilus*, *Nemachilichthys*, *Schistura* and *Travancoria*) and 38 species. They are commonly known as river, torrent or hill stream loaches and as the name suggests, are mostly rheophilic and associated with life in fast-flowing water for which they are well adapted (Tan 2006). Balitorid loaches comprise one of the least studied groups of freshwater fishes in the Western Ghats with very little information on their actual diversity, population and ecology. Even after years of ichthyological explorations, new species of balitorid

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loaches continue to be described from the Western Ghats (Bhoite et al. 2012; Raghavan et al. 2013).

The genus *Travancoria* Hora, 1941, endemic to the Western Ghats region (Jayaram 2010; Kottelat 2012) is represented by two species *Travancoria jonesi* described from the hill streams of Pampadumpara in Periyar River (Hora 1941) and *T. elongata* from Vettilapara in Chalakudy River (Pethiyagoda & Kottelat 1994). While *T. jonesi* is known to occur at multiple sites in at least four river systems (Chalakudy, Periyar, Pampa and Achankovil) (see Raghavan & Ali 2011), *T. elongata* till date was known to have a very restricted distribution with an area of occupancy of 44km². Its distribution in Chalakudy River was considered to be restricted to a 17km stretch (between Athirapilly Waterfall and Thumboormuzhi Dam which includes its type locality, Vettilapara), while in Periyar River it was known to be restricted to a 5km stretch in the Pooyamkutty tributary (Ali & Raghavan 2011). Due to its restricted distribution, combined with threats from pollution, destructive fishing and alien species, *T. elongata* has been assessed as Endangered (B1ab(iii,v)+2ab(iii,v)) in the IUCN Red List of Threatened Species (Ali & Raghavan 2011).

Recent field work in the Periyar River revealed the existence of undiscovered populations of *T. elongata* at two new locations, thereby extending the distribution range of this threatened species. This contribution serves to document this information.

Fish were collected using a combination of gears including cast net, scoop net and a backpack electroshocker, during both day and night. At each location, two specimens each were preserved in 95% ethanol while the rest were released after measuring and photographing them. Counts and measurements follow Pethiyagoda & Kottelat (1994) (Table 1). Specimens referred to in this contribution are deposited in the collections of the Conservation Research Group, St. Albert's College (CRG-SAC), Kochi, India.

Travancoria elongata: CRG-SAC. 2012.7.1-2, 19.v.2012, 2 ex, 85–116 mm SL, India, Kerala, Mlappara, Periyar Tiger Reserve, 9.43°N & 77.31°E, elevation 967m, B. Pereira et al.; CRG-SAC.2012.15.1-2, 02.v.2012, 2ex, 101–127mm SL, India, Kerala, Thanikkudy, Periyar Tiger Reserve, 9.48°N & 77.28°E, 897m, A. Ali et al.; CRG-SAC.2012.8.1-2, 05.iv.2012, 2 ex, 99–101 mm SL, India, Kerala, Mankulam, Idukki, 10.08°N & 76.98°E, 1339m, A. Ali et al.; CRG-SAC. 2011.5.1-2, 21.i.2011, 2 ex, 66–104 mm SL, India, Kerala, Vettilapara, Chalakudy River, 10.29°N & 76.48°E, 55m, A. Ali et al.; CRG-SAC.2010.11.1-2, 2 ex, 67mm SL, India, Kerala, Pooyamkutty, Periyar River, 10.15°N & 76.78°E, 61m, F. Baby et al. (Images 1a to 4c).

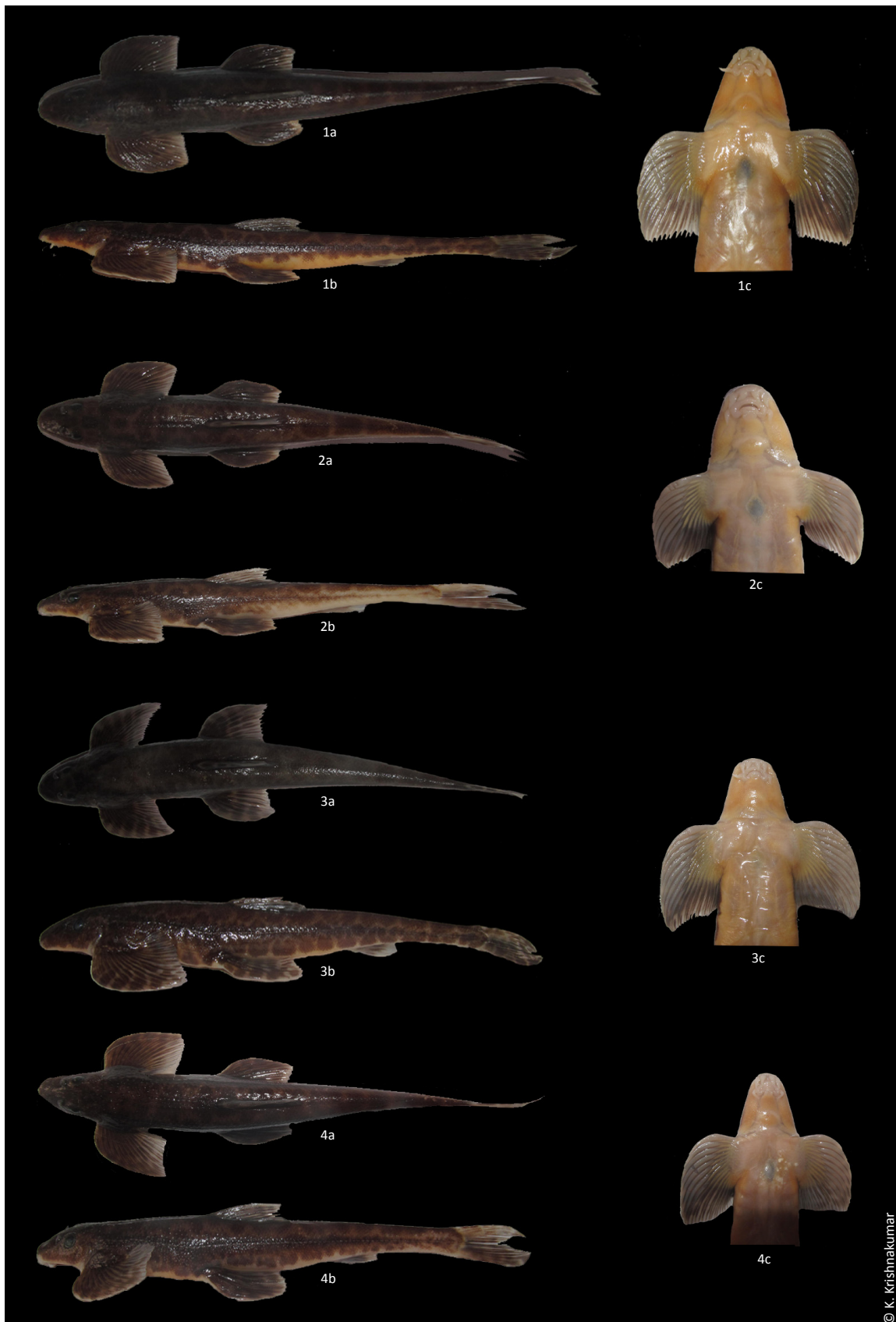
Travancoria elongata is found mostly in fast flowing streams where they are restricted to riffles, runs, cascades and rapids (Kurup et al. 2004; Raghavan et al. 2008). The species is seen attached to boulders, cobbles and bedrock using its broadened pectoral and pelvic fins. At all our collection locations, *T. elongata* was obtained from these typical micro-habitats. An example of the habitat of *T. elongata* in Chalakudy River is shown in Image 2.

The records reported here extend the number of locations in which *T. elongata* are found from two to four (Fig. 1). One of the new locations, Mankulam is ~30km upstream of Pooyamkutty from where it was previously recorded within the Periyar drainage (Radhakrishnan & Kurup 2006). Although we collected the species from streams in Thanikkudy and Mlappara inside the Periyar Tiger Reserve, we consider this as one location as per the IUCN Red List Categories and Criteria as the two sites (distance of ~2–4 km) will be equally threatened from a threatening event which in this case is alien species. This location is at a distance of more than 100km upstream of Pooyamkutty.

Jayaram (2010; p188) mentions that *T. elongata* is found in Kovaicourtalam, Noyyal River (near Coimbatore, Tamil Nadu). It is, however, not known whether this represents the author's personal collection, or a record referred from a secondary source. Since it has not been supported by any reference, we would like to consider this record with caution and refrain from treating it as valid until further information along with voucher specimens become available.

Several researchers have considered *T. elongata* to be a rare species (Biju et al. 1999; Euphrasia et al. 2006), while others have been unable to collect the species in spite of detailed sampling (Ajithkumar et al. 1999). The sites inside the Periyar Tiger Reserve from where we obtained our specimens have been extensively surveyed for the past decade and a half, resulting in the description of several new species and records. However, *T. elongata* was never recorded till date. This indicates that our knowledge of ichthyofauna from many streams including those which have been explored for many decades is still far from complete.

Similar to previously known sites of occurrence (Vettilapara and Pooyamkutty), the new locations from where *T. elongata* has been recorded are also threatened by pollution, alien species and destructive fishing practices. In Mankulam, *T. elongata* co-occurs with five alien species, *Clarias gariepinus*, *Cyprinus carpio*, *Oreochormis mossambicus*, *Xiphophorus helleri* and *Poecilia reticulata*, while the habitats in the stretch



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Image 1a–4c. Specimens of *Travancoria elongata* collected from various sites in the Chalakudy and Periyar River systems (1) Vettilapara/Chalakudy - type locality (2) Mankulam/Periyar, (3) Periyar Tiger Reserve/Periyar, (4) Pooyamkutty/Periyar

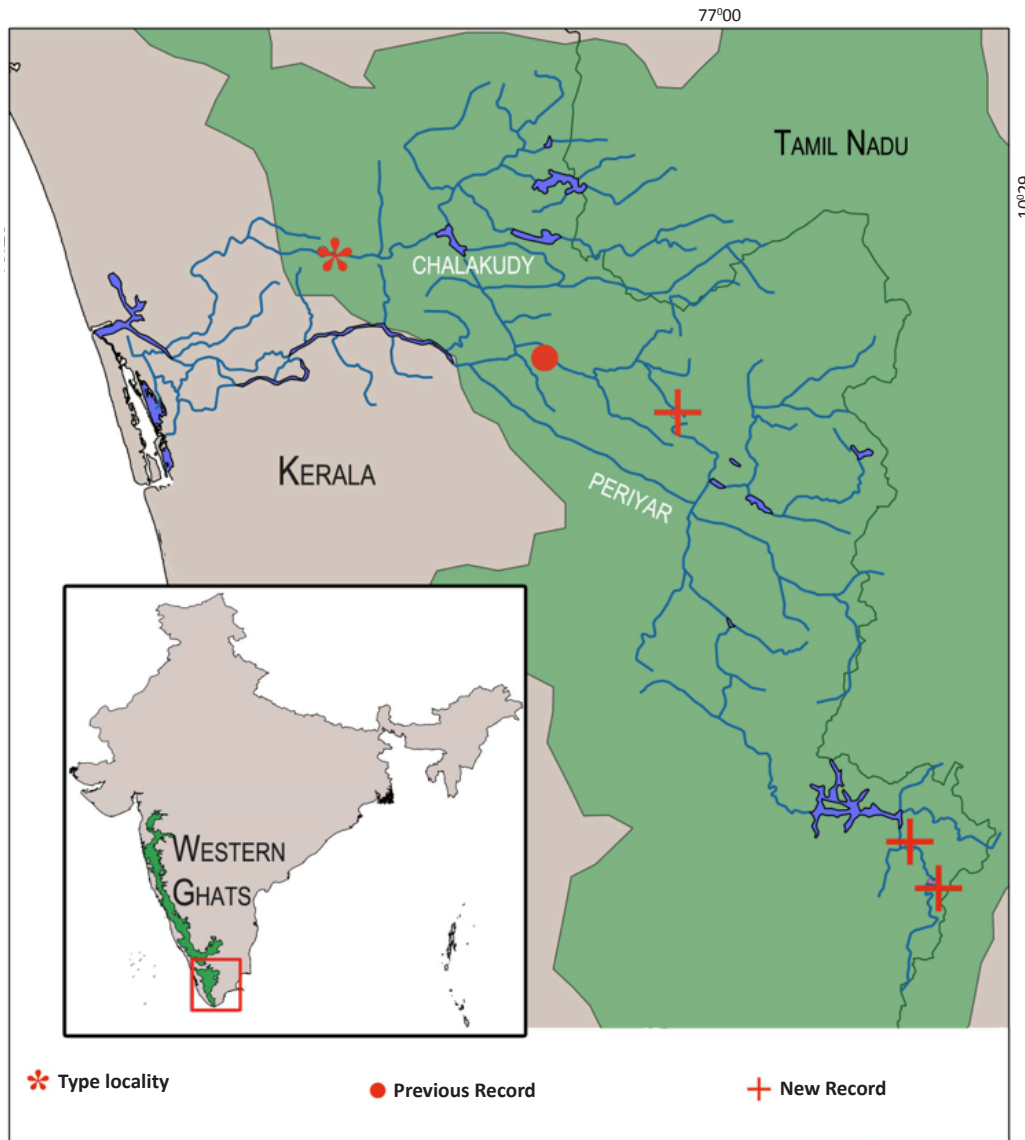


Figure 1. Distribution of *Travancoria elongata* in the Kerala region of Western Ghats



Image 2. Habitat in Vettilapara (Chalakudy River), the type locality of *Travancoria elongata*

between Thanikkudy and Mlappara inside the Periyar Tiger Reserve has populations of *O. mossambicus*. In addition, the habitat in Mankulam is threatened by pollution from plantations of cardamom, pepper and tea, extensive deforestation and loss of riparian vegetation, and the use of poisons and dynamite for fishing. *Travancoria elongata* is also known to be collected for the global aquarium pet trade (Kumar & Devi 2013; Raghavan et al. 2013) through what is largely an unmanaged and unregulated fishery (Raghavan 2010). This open-access fishery is known to be an additional threat to the species in the wild (see Ali & Raghavan 2011).

Since *T. elongata* is found only in four fragmented locations (Thanikkudy and Mlappara considered as a single location), with three of them subjected to severe

Table 1. Biometrics of *Travancoria elongata* from the Chalakudy and Periyar river systems

Morphometric characters	Vettilapara (Chalakudy)		Pooyamkutty (Periyar)		Mankulam (Periyar)		Periyar Tiger Reserve (Periyar) n=4 (CRG-SAC.2012.7.1-2 & CRG-SAC.2012.15.1-2) Range (Min-Max)
	S1	S2	S1	S2	S1	S2	
Standard Length/SL (mm)	66	104	67	85	99	101	85–127
% SL							
Head length	14.42	15.89	15.4	15.57	14.19	16.32	12.39–14.77
Head depth	5.77	7.57	5.51	7.36	6.07	7.74	5.72–6.80
Maximum head width	10.66	12.22	11.87	12.08	11.33	12.65	10.23–12.88
Head width at nares	7.77	9.54	8.23	8.24	8.65	10.78	8.71–10.33
Inter orbital width	4.92	5.54	5.12	5.42	5.01	5.17	4.74–6.94
Snout length	9.41	9.66	9.84	10.07	10.11	10.59	8.69–10.34
Eye diameter	3.0	3.98	2.76	3.43	2.52	2.54	2.66–3.43
Body depth at dorsal origin	10.0	11.62	10.81	11.12	11.01	11.76	10.12–10.54
Body depth at anus	6.28	6.75	7.29	8.84	7.77	9.62	7.12–7.84
Body width at pelvic origin	12.75	14.87	12.03	14.56	13.49	14.95	12.79–14.0
Predorsal length	40.24	42.48	43.54	44.43	41.01	42.97	39.60–41.58
Preanal length	67.44	68.18	69.63	71.49	70.49	71.41	67.63–70.58
Length of caudal peduncle	22.37	23.18	23.15	26.25	22.77	22.79	23.63–27.45
Depth of caudal peduncle	3.56	4.01	4.34	5.37	4.47	4.63	3.56–4.60

Vettilapara (Chalakudy) S1 - CRG-SAC.2011.5.1; S2 - CRG-SAC.2011.5.2; **Pooyamkutty (Periyar)** S1 - CRG-SAC.2010.11.1; S2 - CRG-SAC.2010.11.2; **Mankulam (Periyar)** S1 - CRG-SAC.2012.8.1; S2 - CRG-SAC.2012.8.1

threats, the species will still need to be retained under the Endangered Category (EOO < 5000 sq.km) in the IUCN Red List of Threatened Species. In addition, very little is known about the natural history of this species, including its feeding ecology, reproductive biology, mortality rates and longevity. Future research, therefore, needs to focus on filling these knowledge gaps.

Our study reiterates the fact that ichthyofauna of Western Ghats is influenced by the Wallacean and Linnean shortfalls and is in need of extensive micro-geographic surveys and improved taxonomic research (Dahanukar et al. 2011; Raghavan et al. 2012) so as to generate baseline data to inform conservation actions for many endemic and threatened species like *T. elongata*.

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