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Hidden diversity? – The unsolved riddle of Indian monozoic tapeworms (Cestoda: Caryophyllidea)

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As per IUCN data, India is a megadiverse country and accounts for 7–8% of all recorded species, including over 91,000 species of animals. Despite acknowledging this high diversity, what happens if we look into the world of the tiny unsegmented freshwater fish-cestodes (Order Caryophyllidea)? As per the global research, there are about 121 valid species belonging to 42 genera. Contrarily, there are 197 Caryophyllid species, reported only from India. Many of these taxa are endemic and new – e. g., our recently discovered *Mystocestus anindoi* represent a new species of monozoic tapeworm (also a new genus) from *Mystus* catfishes. Some of them also have unique evolutionary significance and portray different aspects related to evolution and host biogeography (e. g., vicariance observed in the only Indomalayan *Paracaryophyllaeus* species, *P. lepidocephali*). But as a whole, current knowledge on their taxonomy is still incipient and the quality and reliability of many published data are questionable. Also, there are other unresolved-riddles related to species complex, cryptic species, confusing generic status, biogeography and life-cycles. Proper identification of these often-neglected fauna can be the very-first stepping-stone to solve these riddles. One of our ongoing projects is focused to find out the cause behind the morphological variations reported in a large number of synonyms (24 synonyms as per 2011 data and 50+ as per present data) of the parasite *Lytocestus indicus* (Moghe, 1925). We have fixed the parasite using different fixatives for morphological-study and sequencing hologenophores of the same to assess if there are any real variation in their genotype or those are fixation-induced variations. Such critical evaluation applying integrative taxonomy can be very useful to assess that either the Indian cestode data is an overestimate or underestimate. Detailed evaluation of the current scenario of the Indian monozoic (i. e.; unsegmented) tapeworms are crucial as they constitute an important part of the overall biodiversity. After methodical taxonomic identification, untangling their life cycle will help us to know the probable public health risks including zoonosis. Their potential role as bioindicator species in the sector of heavy metal pollution can be also studied. Moreover, these tiny tapeworms are like the tip of the iceberg that can lead towards vast possibilities.