

## Short Communication

### Rediscovery of *Travisia arborifera* Fauvel, 1932 (Annelida, Sedentaria, Travisiidae) in the Parangipettai coastal waters of Southern India

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An uncommon species of *T. arborifera* Fauvel, 1932, has now been reported in the Parangipettai coastal waters through systematic field surveys and taxonomic examination, following a 70-year gap. Fauvel originally described the species in 1932 and 1953 from Indian waters. Afterwards, there have been no records of this species. Updated information on its distribution and morphology, along with a description of *T. arborifera* at Parangipettai coastal water, is provided in this paper.

**[Keywords:** Bay of Bengal, India, Native species, Occurrence, Tamil Nadu, *Travisia*]

#### Introduction

*Travisia arborifera* Fauvel, 1932 belongs to the family Travisiidae Hartmann-Schröder, 1971. This family has recently been elevated from a sub-family to a family level<sup>1</sup>. Travisiidae Hartmann-Schröder, 1971 contains a single valid genera, *Travisia* Johnston, 1840, which consists of 38 recognised species<sup>2</sup>.

*Travisia*, commonly known as stink worms due to their overtly unpleasant odour, is found across a range of habitats, from the intertidal zone to depths of 8,300 meters<sup>2</sup>. Travisiidae species are non-selective, burrowing deposit feeders in fine sediments<sup>3</sup>.

Taxonomic characteristics of these organisms primarily rely on quantitative morphological traits such as the total number of segments, chaetigers, branchiae, and pygidial lobes, given the simplicity of their outward features<sup>4-5</sup>. *Travisia* can be categorised into two groups based on the presence or absence of branchiae, as described by Plathong *et al.*<sup>6</sup>. Group I - species without branchiae, and Group II - species with branchiae. Group II species can further be divided into two subgroups, namely (a) branching branchiae,

and (b) cirriform branchiae. There are currently three *Travisia* spp. that have defined branching branchiae: *T. filamentosa* Leon-Gonzalez 1998, Baja California, Mexico; *T. satunensis* Jintana *et al.*, 2023, and *T. arborifera* Fauvel, 1932, Andaman Sea, India (Table 1).

*Travisia arborifera*, a native species of India, exhibits a distinctive feature in the form of branched branchiae. The prime aim of the present study is to provide a taxonomical description of *T. arborifera*, accompanied by updated photographic evidence. The previous occurrences of *T. arborifera* by Fauvel, 1932 and 1953 (Andaman Sea, Odisha) and Berkeley & Berkeley (1939)<sup>7</sup> (North America) may represent a misidentification given the geographic distribution and the absence of a detailed description.

#### Materials and Methods

Samples were collected in August 2022 as part of the routine benthic survey project funded by NCCR – MoES. Sediment samples were collected by using a Van Veen grab (0.1 m<sup>2</sup>) and sieved through 0.5 mm mesh. A total of three specimens were collected from Parangipettai coastal waters (79°48'14.6478" E, 11°30'1.8642" N; Fig. 1). Sampling station areas covered a depth range of 12 to 20 meters. All the specimens were preserved in 5% formalin. The specimens were further examined under a ZEISS Stemi 2000-C Stereomicroscope, and photographs were taken using a ZEISS Axiocam 105 colour camera. The taxonomical identity of *T. arborifera* was confirmed following the description by Fauvel<sup>8</sup>. Voucher specimens were deposited in the Reference Museum of the Centre of Advanced Studies in Marine Biology (CASMB), Faculty of Marine Sciences, Annamalai University (AU), Parangipettai, Tamil Nadu, India, for future reference (TRAVIS.1, TRAVIS.2, and TRAVIS.3).

#### Results

##### Systematics

Family: Travisiidae Hartmann-Schröder, 1971

Genus: *Travisia* Johnston, 1840

*Travisia arborifera* Fauvel, 1932 (Figs. 2 – 4, Table 1)

Table 1 — Comparison table of *Travisia* species with branched branchiae

Species morphology	<i>T. arborifera</i> Fauvel, 1932	<i>T. filamentosa</i> de León González, 1998	<i>T. satunensis</i> Plathong <i>et al.</i> 2023	Present specimen of <i>T. arborifera</i>
Chaetigers	36	33	37	36
Prostomium	Not detailed	very small cone	Rounded with conical tip	conical, tip blunt
Mouth	Not detailed	Not detailed	Many fold	Sits between 1-2 chaetiger
Nephridial pores	3 to 14	1 to 14	3 to 14	3 to 14
Distribution of branchiae (chaetigers)	2 to last 6–7	3 to last 5–6	2 to last 2	2 to last 6–7
Branchiae (pairs)	29	28	34	29
Branchiae shape	branched, pectinated arborescent structure	branched (filamentous)	Branched and last three digitiform	branched pectinated short, arborescent structure
Anal cirri	6–8 short cirri	6	10 cirri: 6 digitate and 4 short	6 short cirri equal length
Nuchal organ	present	present	present	present
Body length & width (mm)	38, 10–11	68, 12	30.6, 7.4	15, 4
Depth (m)	7-100	55	2–14	12 to 20
Location	Andaman Sea, Odisha (India)	Lower California, Eastern Pacific	Andaman coast, Thailand	Tamil Nadu (India)

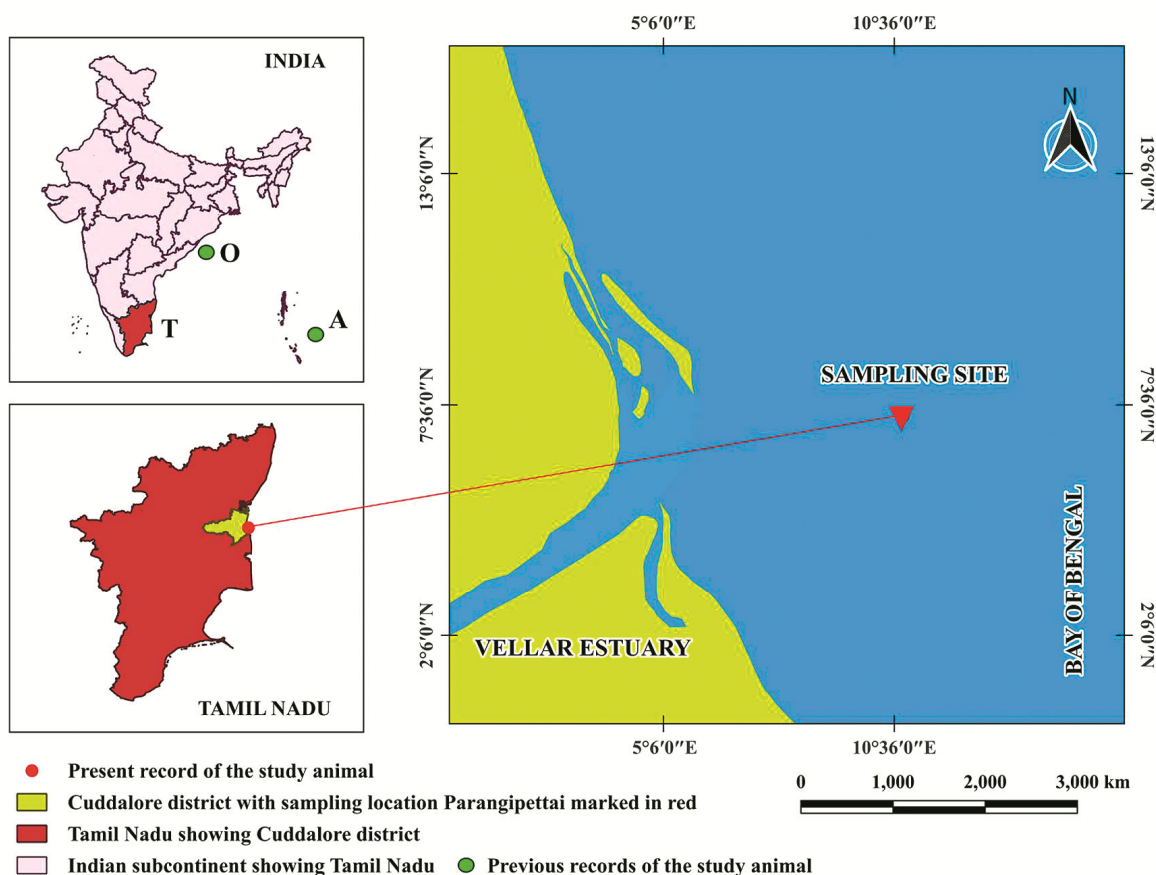


Fig. 1 — Map showing the sampling location of Parangipettai coastal waters, Southern India, Bay of Bengal. T - Tamil Nadu; O - Odisha; and A - Andaman Sea

**Material examined**

One specimen (TRAVIS.1/CASMB (AU), 15 mm long, 4 mm wide, Parangipettai coastal waters, Tamil Nadu, Bay of Bengal, India, (79°48'14.6478" E,

11°30'1.8642" N), August 2022. Specimen illustrations are provided in Figures 2 – 4. Environmental characteristics: Salinity - 27 psu, depth range - 12 to 20 m, sediment type - sandy clay. Other

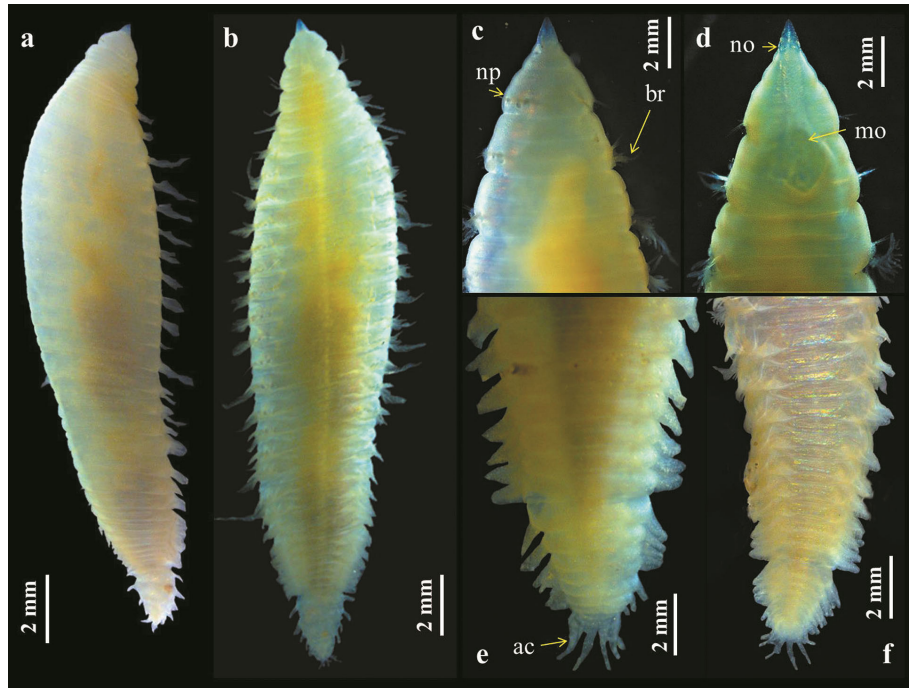


Fig. 2 — *Travisia arborifera*: a) Dorsal view of complete specimen, b) Ventral view of complete specimen, c) Dorsal view of anterior region, d) Ventral view of anterior region, e) Dorsal view of posterior region, and f) Ventral view of posterior region. Abbreviations: Nephridial pores - np, branchiae - br, mouth - mo, anal cirri - ac, nuchal organ - no

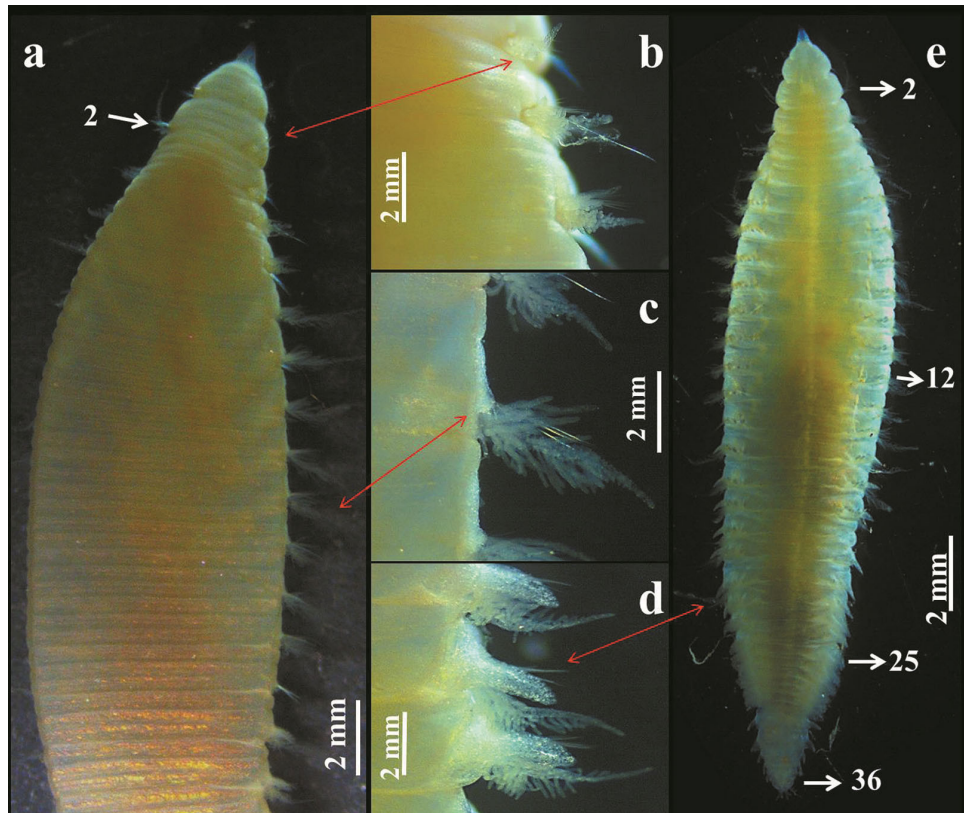


Fig. 3 — *Travisia arborifera*: a) Dorsal view of specimen, b) Branchiae of anterior segments, c) Branchiae of middle segments, d) Branchiae of posterior view, and e) Ventral view of complete specimen (2, 12, 25, 36 - chaetiger)

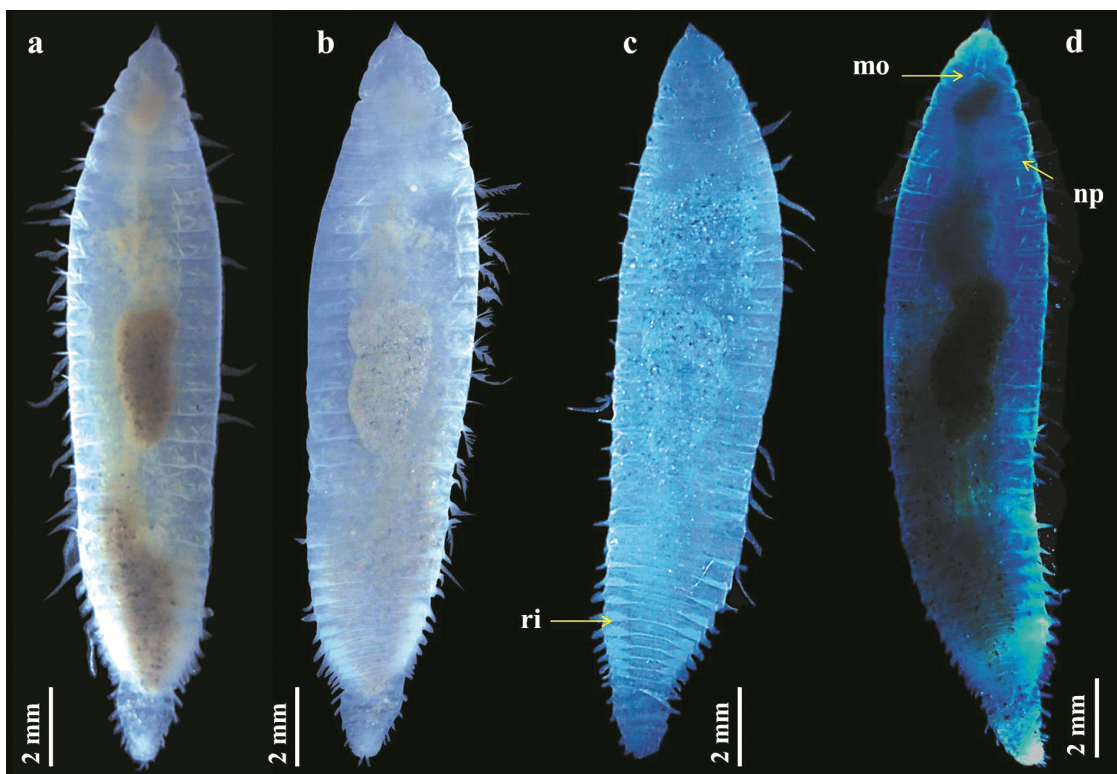


Fig. 4 — *Travisia arborifera*: a) Ventral view of complete specimen without added methyl green stain, b) Dorsal view of complete specimen, c) Dorsal view of complete specimen added methyl green stain with cover slip on the specimen, and d) Ventral view of complete specimen added methyl green stain. Abbreviations: ridge - ri, mouth - mo, nephridial pores - np

specimens: TRAVIS.2/CASMB (AU) – 10 mm long, 3 mm wide; TRAVIS.3/CASMB (AU) – 15 mm long, 4 mm wide.

#### Description

Body fusiform, short, plump, 15 mm long, 4 mm wide, 36 chaetigers, body wall whitish with pale yellow in formalin (Fig. 2a, b). Epidermal papillae present (Fig. 4c), ventral groove absent. Prostomium conical, tip blunt with two small nuchal organs present in lateral slits (Fig. 2b – d). Peristomium short, smooth, with annulation. Mouth with many folds between segments 1 and 2, sometimes widely open (Figs. 2d & 4d). The first chaetiger is biannulate; from the third to the nineteenth chaetigers are triannulate. Chaetigers from the twentieth to the twenty-sixth are biannulate. Posterior chaetigers, from the twenty-seventh to the thirty-sixth chaetiger, are uniannulate, with a ridge present. Gills branched, present along chaetigers 2 to 29 (Fig. 2b), each with many filaments; last 7 chaetigers lack branchiae, not visible along the last 6 segments. Branchiae are larger along mid-body segments, progressively smaller notopodial and neuropodial chaetal rami well separated from each other, with a bundle of simple, smooth or very finely barbed capillary chaetae inserted in a pit, apparently

arising directly from the body wall. A small triangular lamella ahead of branchiae, a similar, slightly larger lamella in neuropodia. Lamellae from chaetiger 10, progressively larger to chaetiger 14, and continue to enlarge along the body (Fig. 2b). Nephridial pores are present along chaetigers 3 to 14. Last 21 to 30 segments with a small ridge (Fig. 4c). Branchiae were gradually increasing in length from the anterior to the mid-body and eventually became smaller at the posterior end. Branchia looks like an arborescent structure. 2<sup>nd</sup> chaetiger branchiae looks partially pectinated, short and fleshy (Fig. 3b). Posterior region tapered, with 7 segments, roughly rectangular with 6 short cirri, anus wide and sub-terminal.

#### Distribution

In India, the species is reported from the Andaman Sea, Odisha (Puri), and Bay of Bengal (Fauvel 1932, Fauvel 1953), depth 7 – 100 m. Present report is from Parangipettai coastal water, state of Tamil Nadu, India, Bay of Bengal (12 to 20 m).

#### Remarks

Branchiae were worn out after preservation in some specimens. In addition, the shape of the pygidium

region was also modified from live to preserved specimens, with the terminal region of the pygidium swelled after preservation (Figs. 2b, 3e, and 4a – d). On the contrary, the pygidium of live specimens were normal (Fig. 2e, f). Among *Travisia* species, only the following three species are noted for possessing strongly branched branchiae, namely *T. arborifera* from the Indian Ocean, *T. filamentosa* de León-González, 1998 reported from California<sup>10</sup>, and *T. satunensis* (Plathong *et al.*, 2023) from the Andaman Sea.

## Discussion

The re-discovery of *T. arborifera* in India holds significant importance as it marks a unique occurrence, previously documented only by Fauvel<sup>8</sup> in 1932 and 1953. Notably, no observations of this species have been reported since that time, spanning a period of 70 years. The present study unveils the reappearance of *T. arborifera* in the coastal waters of Parangipettai, Bay of Bengal. The specimens were recovered from areas characterised by a mixture of sand and clay, within a depth range of 12 to 20 m, yielding a total of three specimens.

*Travisia arborifera* exhibits well-developed branchiae, a distinctive trait within the genus *Travisia*. The present specimen is compared with the species reported by Fauvel as the base specimen, along with *T. filamentosa* and *T. satunensis* (Table 1). The current samples closely align with the original description of *T. arborifera*, having a characteristic arborescent structure of branchiae beginning from the second chaetiger, and the present specimen matches *T. arborifera* Fauvel, 1932 with 36 chaetigers, differing from *T. filamentosa* (33 chaetigers) and *T. satunensis* (37 chaetigers). Nephridial pores are present from chaetiger 3 to 14. This morphology closely corresponds to Fauvel's 1932 illustration of *T. arborifera*. In contrast, the observed morphology diverges notably from *T. filamentosa* and *T. satunensis*, which exhibit significant differences in branchial structure, chaetiger, and nephridial pore positioning that are not evident in the current specimens. In the present specimen, the shape of the branchiae and their distribution from the second to the last 6 – 7 chaetigers, and the arborescent, pectinated structure, match *T. arborifera* (Fauvel, 1932), while *T. filamentosa* and *T. satunensis* show different patterns. The present specimen has 6 short anal cirri, consistent with *T. arborifera* and *T. filamentosa*, but differing from *T. satunensis*, which has a total of 10 cirri (6 digitate and 4 short). Importantly, this study marks the

first documented occurrence of *T. arborifera* in Tamil Nadu, India.

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## Conflicts of Interest

On behalf of all the authors, the corresponding author confirms that there are no conflicts of interest.

## Author Contributions

PC: Sample collection, identification and manuscript preparation; PM: Overall conceptual guidance and manuscript preparation; SS: Sample collection.

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