

**A NEW RECORD OF THE ECHIURAN *ECHIURUS ECHIURUS*  
(PALLAS, 1767) FROM THE EAST COAST OF SOUTHERN AFRICA**

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The species *Echiurus echiurus* (Pallas, 1767) of the family Echiuridae, originally described from shallow waters of the Belgian coast, was later recorded from many other localities in the northern hemisphere, predominantly in cold waters and extending even into the Arctic. The discovery of this species from the warm, subtropical waters of the east coast of southern Africa is the first record of its occurrence in the southern hemisphere and marks a considerable extension of its geographic range. The species is briefly redescribed and some of the taxonomic characters have been reviewed.

According to the system of classification adopted by Stephen and Edmonds (1972), the phylum Echiura contains four families, 34 genera and 129 species. However, since the publication of their monograph, several new species have been added to the list. According to Popkov (1992), approximately 145 species have been described.

Knowledge of the echiuran fauna of southern Africa is limited; only 20 species belonging to five genera are currently known from that subcontinent. Some of the earlier and more significant works on this group in southern Africa are those of Wesenberg-Lund (1959, 1963) and Stephen and Cutler (1969). Biseswar (1985) provided a checklist of all the genera and species from southern Africa and mapped their distribution. Since 1984, several new species or new records have come to light (Biseswar 1984, 1988a, b). Although most of the species have been found in shallow waters of the intertidal zone, a few have been reported from considerable depths. Investigations into the deeper continental shelf and abyssal fauna should reveal new species or new records.

This study reports on the first record of the occurrence of *Echiurus echiurus* from the subtropical waters of the east coast of southern Africa. The species is diagnosed and briefly redescribed.

**DESCRIPTION**

*ECHIURUS ECHIURUS* (PALLAS 1767)

**Material**

One sexually mature male specimen; Natal north

coast, off Tugela Bluff; collected 15 June 1989 at 29°25.9' S – 31°43.6' E from 70 m depth.

**Description colour**

White in preserved specimen.

**External features**

*Proboscis* – Missing.

*Trunk* – Cylindrical or sausage-shaped (Fig. 1), 25 mm long, widest diameter 11 mm. Body wall thin and transparent throughout, with the result that internal organs and contents of gut are visible. Outer layer of integument in posterior half of trunk separated from inner layers but still attached to trunk. Papillae conical, projecting from surface of integument, arranged in concentric rings around trunk. With the unaided eye, papillae appear as spherical, transparent spots. Rows of larger papillae alternate with three or four rows of uniform smaller papillae.

*Setae* – One pair of ventral setae (Fig. 2), golden-brown in colour, located about 5 mm from the anterior tip of trunk. Each seta is about 3.5 mm long, consisting of a more or less cylindrical shaft with a hook-like terminal blade. Curved terminal part flattened with faint concentric markings. Internally, setae located in setal sacs, supported by thin radiating muscle strands. A narrow interbasal muscle present between the setae (Fig. 3). Two rows of prominent anal setae around posterior end of trunk (Fig. 1). Eight setae in the anterior row and six in the posterior row.

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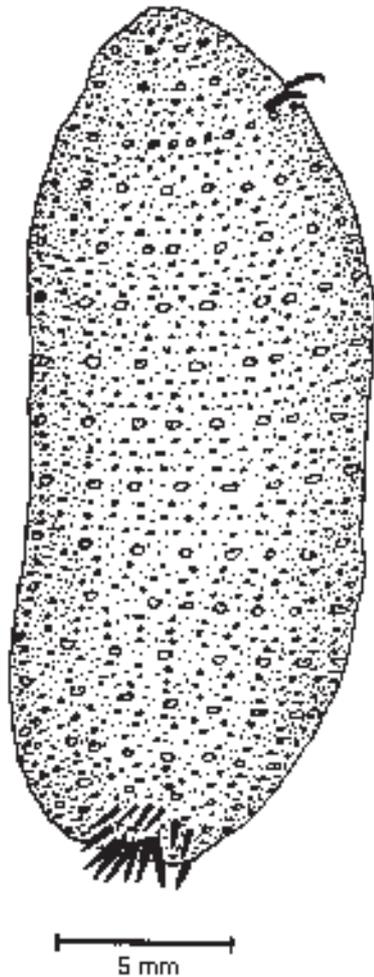


Fig. 1: Lateral view of *Echiurus echiurus*

#### Internal anatomy

**Alimentary canal** – Alimentary canal long and coiled, attached to body wall by few, thin and delicate mesenteric strands. Foregut short, more or less a straight tube, leading from pharynx and forming a loop at posterior end (Fig. 3). Intestinal ring vessel located at terminal end of foregut just after the loop (Fig. 3). Remainder of intestine thin-walled, transparent with sausage-shaped faecal pellets. Rectal caecum absent.

**Gonoducts** – Two pairs of gonoducts (Fig. 4), tubular, considerably distended at terminal end and post-setal in position. All four gonoducts compactly filled

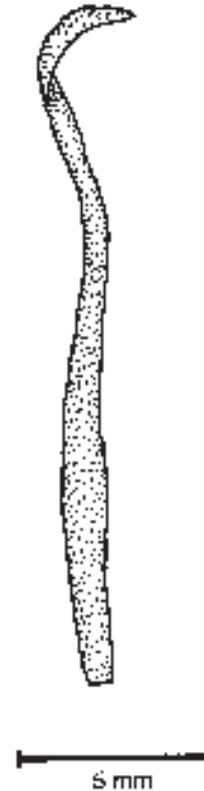


Fig. 2: Ventral seta of *Echiurus echiurus*

with spermatozoa and exceeding more than half the length of the trunk. Gonostomes small, funnel-like, opening into base of gonoduct.

**Blood system** – Only ventral vessel and intestinal ring sinus visible. Dorsal and neuro-intestinal vessels damaged as a result of poor preservation.

**Anal vesicles** – Anal vesicles absent, probably damaged because posterior part of alimentary canal fragmented in several places.

#### DISCUSSION

The subfamily Echiurinae is distinguished in having two rings of anal setae around the posterior end of the trunk. It is represented by a single genus, *Echiurus*, in which the proboscis is well developed but often deciduous. The papillae are arranged in rows over

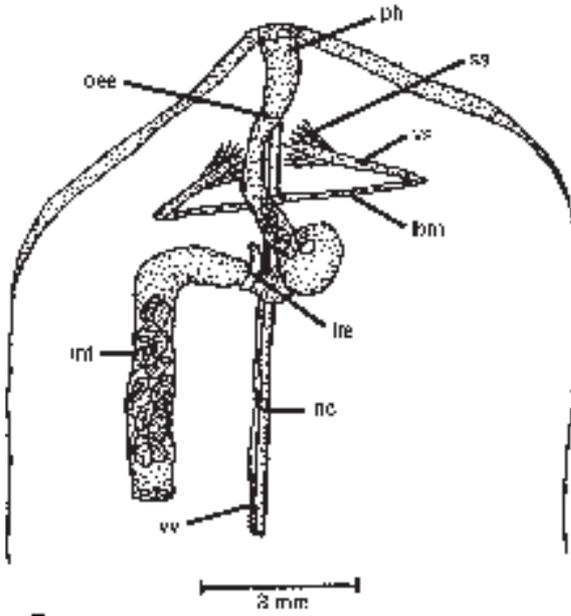


Fig. 3: Anterior end of trunk cavity of *Echiurus echiurus*, showing the internal organs; interbasal muscle (ibm), intestine (int), intestinal ring sinus (irs), nerve cord (nc), oesophagus (oes), pharynx (ph), setal sac (ss), ventral seta (vs), ventral vessel (vv)

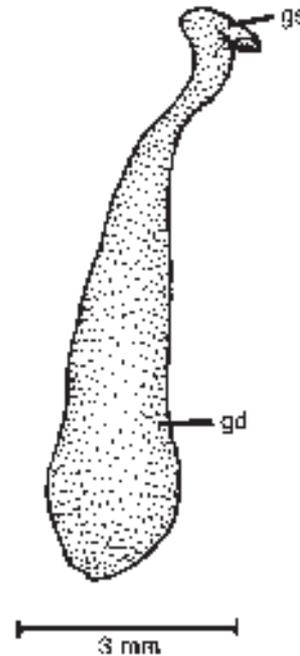


Fig. 4: Gonoduct (gd) of *Echiurus echiurus*, showing the basal gonostome (gs)

the surface of the trunk. Other distinguishing features of the genus are the presence of one to three pairs of gonoducts with gonostomes that are not elongate and spirally coiled. A post-pharyngeal diaphragm is present which almost divides the coelom into two parts. An intestinal ring sinus connects the dorsal and neuro-intestinal vessels. Unlike the bonellids, there is no sexual dimorphism.

The genus *Echiurus* is currently represented by four species. Stephen and Edmonds (1972) consider *Echiurus echiurus alaskanus* Fisher, 1948 as a subspecies of *E. echiurus*. The species *E. echiurus* was originally described as *Lumbricus echiurus* by Pallas (1766) (quoted from Stephen and Edmonds 1972). According to Gislén (1940), the type specimens were found in shallow water along the coast of Belgium. Since its discovery from that coast, the species has been recorded from many other localities (Stephen and Edmonds 1972). The anatomy of *E. echiurus* is well known because it has been redescribed and illustrated in considerable detail by Greeff (1879) and Spengel (1880). The present specimen from the east coast of southern Africa closely approaches the descriptions given by those authors.

The characteristic arrangement of the dermal papillae in ring rows, the presence of two pairs of postsetal gonoducts and the structure of the gonostomes are almost identical to the descriptions provided by Greeff (1879), Spengel (1880) and Stephen and Edmonds (1972). The number of anal setae appears to be variable in *E. echiurus*. According to Stephen and Edmonds (1972), there are five to nine (usually seven) setae in the anterior row and five to eight (usually six) setae in the posterior row.

*Echiurus antarcticus* Spengel, 1912 is another species that has been recorded from southern Africa (Stephen and Cutler 1969). Those specimens were collected from the KwaZulu-Natal coast in the vicinity of Durban. *Echiurus antarcticus* differs from *E. echiurus* in possessing three pairs of gonoducts and a proboscis that is T-shaped.

From the recorded localities given by Stephen and Edmonds (1972), *E. echiurus* is a northern species that is found predominantly in cold waters and which extends even into the Arctic. The present discovery of this species from the warm, subtropical waters of the east coast of southern Africa is a first record of its occurrence in the southern hemisphere and marks a considerable extension of its geographic range.

Additional records in the future may indicate that this species has a bipolar distribution.

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