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A NEW SPECIES OF *SAGITTA* (CHAETOGNATHA) FROM D'ENTRECASTEAUX CHANNEL, TASMANIA

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(with one table and two text figures)

ABSTRACT

A new species of the genus *Sagitta* (Chaetognatha), *S. guileri* sp. nov. found in D'Entrecasteaux Channel, Tasmania is described and figured. Its relation to *S. neglecta* Aida is discussed and its distribution in the south-east coastal waters of Tasmania is given.

INTRODUCTION

During a study of the zooplankton of the south-eastern coastal waters of Tasmania, an abundance of specimens of a species of *Sagitta* were collected in the northern parts of D'Entrecasteaux Channel, southern Tasmania. These specimens differ from all known species and are considered to represent a new species for which the name *Sagitta guileri* sp. nov. is proposed. The species is named in honour of Dr. E.R. Guiler, Reader in Zoology, University of Tasmania.

DESCRIPTION OF SPECIES

Sagitta guileri sp. nov.

(figs. 1a-g)

Type Material

Holotype, paratypes 10; Tasmanian Museum Registration Nos. K762 - K763. Taken in a midwater (10 m) plankton tow during the night of 22nd December 1971, off Barnes Bay, Bruny Island, D'Entrecasteaux Channel, Tasmania.

Description

Body length, 8.0 - 10.5 mm based on 25 mature (stage IV) specimens.

Body rigid and opaque in formalin preserved specimens; length of fully mature (stage IV) specimens reaches to 10.5 mm; head is of normal size, approximately equal to the widest region (mid region) of the body; hooks totally concealed if viewed from dorsal side of head; eyes rounded with the pigmented area well developed and in the form of letter 'T' lying sideways with the top part pointing laterally; intestinal diverticulum present but not obvious; corona ciliata absent.

Tail region forms between 25.5 and 29.6% of the total body length (excluding the tail fin); the number of hooks may be 6 or 7; the number of anterior teeth is either 4 or 5; there are between 6 to 9 posterior teeth.

Collarette present, extending from head to tail region as far as middle region of the tail fin; relatively thicker at the neck and the vicinity of seminal vesicles.

Anterior fin begins at a distance (approximately 4.0% of the body length) behind posterior end of ventral ganglion; elliptical in shape; shorter than posterior fin with the widest part at the middle region; entirely supported by rays.

Posterior fin long and situated more on tail region than on the body; completely

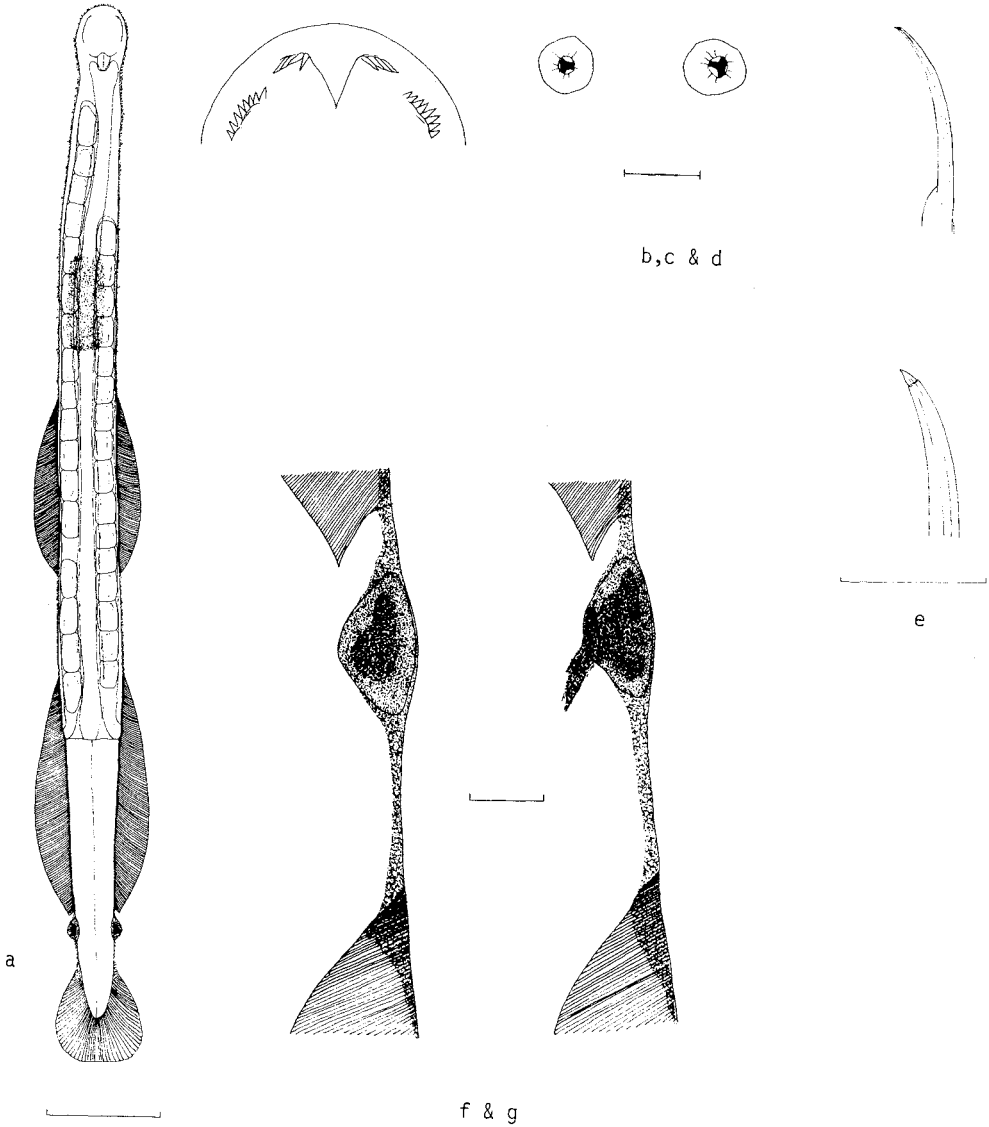
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FIG. 1. - *Sagitta guileri* sp. nov.

- a. Entire animal, ventral view (scale 1.0mm long).
- b. Ventral view of anterior region of the head showing anterior and posterior teeth (scale 0.1mm long).
- c. Detailed structure of eyes (scale as b.).
- d. Detailed structure of 3rd right hook (counted from ventral side) (scale as b.).
- e. Detailed structure of distal region of 3rd right hook (scale 0.05mm long).
- f. Mature seminal vesicle (scale 0.1mm long).
- g. Mature seminal vesicle (bursting) (scale as f.).

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supported by rays; posterior end terminates just in front of anterior tip of seminal vesicles.

Ovaries long, one on each side reaching up into the neck region; ova rounded and large, in one row, filling the body cavity.

Seminal vesicles situated near posterior fin; roundish to triangular in shape with the protuberance at the mid-lateral region; bursting at the protuberance (mid-lateral edge) when mature.

DISTRIBUTION

S. guileri sp. nov. was very abundant in the northern parts of the D'Entrecasteaux Channel. The maximum number collected in a tow was 1005 (72.9 specimens per cubic meter). It was captured usually during night tows and found to be abundant from November to January. During the remaining months the number observed was low (less than 1.2/cubic meter).

A large number of inshore and offshore coastal zooplankton samples have been studied. However, *S. guileri* sp. nov. was found only in the inshore waters. The localities of zooplankton stations sampled and those where *S. guileri* sp. nov. was encountered are shown in fig. 2.

DISCUSSION

Sagitta guileri sp. nov. belongs to the 'neglecta' group (Tokioka and Pathansali 1963; Alvarino 1967) being most closely related to *S. neglecta* Aida. The main characters in which it can be distinguished from *S. neglecta* are: i) low number of posterior teeth; ii) position of anterior fin in relation to ventral ganglion; iii) extended length of ovaries; iv) shape of seminal vesicles. In table 1, characteristic features of *S. guileri* sp. nov. are compared with those of *S. neglecta* Aida described by Michael (1911, 1919), Thomson (1947), Sund (1959), Tokioka (1959), and Alvarino (1967).

The absence of the corona ciliata in *S. guileri* sp. nov. is one of the main features in which it differs from *S. neglecta*. However, this character is of small taxonomic value owing to the fact that the corona ciliata does not usually persist in 5% formalin preserved specimens (Alvarino 1967).

The number of posterior teeth in *S. guileri* sp. nov. is low compared with *S. neglecta* (table 1). Californian specimens of *S. neglecta*, apart from having a low number of posterior teeth, have the remaining characters agreeing with *S. neglecta* (Michael 1911). Ritter-Zahony (1911) recorded the number of posterior teeth in his *S. neglecta* specimens from tropical waters of Indian and Pacific Ocean, as 12 to 18 in large specimens (7 - 10 mm).

Michael (1919) found in his Philippine specimens that three out of ten specimens he studied had the anterior fin beginning 1.0 to 1.5% of the body length behind the ventral ganglion. In the remaining specimens the anterior fin began at the ventral ganglion. Similarly, Alvarino (1967) described her specimens of *S. neglecta* from South China Sea and the Gulf of Thailand as having the anterior fin beginning a short distance behind the posterior end of the ventral ganglion. From her figures (Alvarino 1967, p. 179, figs. 46A-D) it is evident that the anterior fin begins approximately 1.0% of the body length, behind the ventral ganglion. Ritter-Zahony (1911) reported that his *S. neglecta* specimens had the anterior fin beginning just behind or a little way behind the ventral ganglion. In *S. guileri* sp. nov. the anterior fin begins approximately 4.0% of the body length behind the ventral ganglion.

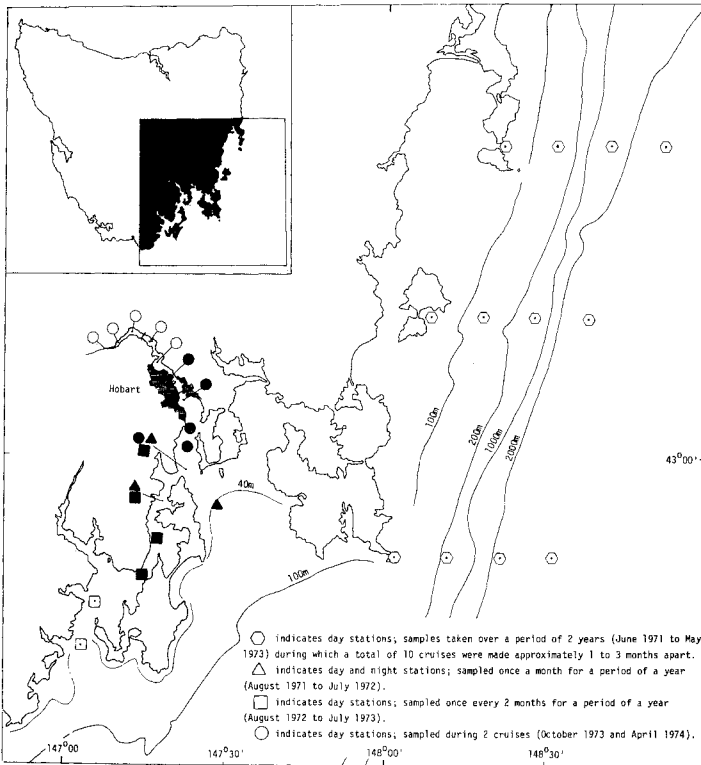
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FIG. 2. - Zooplankton stations in the south-eastern coastal waters of Tasmania.

Solid symbols indicate stations where *S. guileri* sp. nov. was found; open symbols indicate stations where *S. guileri* sp. nov. was not found.

communication) that "a careful comparison of *S. guileri* sp. nov. and recognised *S. neglecta* from Port Hacking may well suggest consistent differences." Unfortunately, an attempt to obtain samples of this material for comparison with that described herein was unsuccessful.

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The structure of ovaries and ova of *S. guileri* sp. nov. is similar to that of *S. neglecta* described by Alvarino (1967). However, in *S. neglecta* the ovaries reach up to midway between the neck and ventral ganglion whereas in *S. guileri* sp. nov. they extend into the neck region.

The seminal vesicles of *S. guileri* sp. nov. differ from those of *S. neglecta* in shape (see table 1). The shape of the seminal vesicles of *S. neglecta* has been described by Alvarino and as claimed by Michael (1911) is similar to that of the seminal vesicles of *S. serrato-dentata*.

The relationship of *S. guileri* sp. nov. to material from south eastern Australia recorded (Thomson 1947) as *S. neglecta* is not clear (table 1). However, Professor Thomson, after examining material of the new species has expressed the opinion (personal

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REFERENCES

- Alvarino, A., 1967: The Chaetognatha of the NAGA Expedition (1959-1961) in the South China Sea and the Gulf of Thailand. Pt. 1. Systematics. *NAGA REP.* 4(2), 1-195.
- Michael, E.L., 1911: Classification and vertical distribution of the Chaetognatha of the San Diego region. *Univ. Calif. Publ. Zool.* 8(3), 21-170.
- _____, 1919: Report on the Chaetognatha collected by the United States Steamer "Albatross" during Philippine Expedition, 1907-1910. *U.S. Natn. Mus. Bull.*, 100, 1(4), 235-77.
- Ritter-Zahony, R., 1911: Chaetognatha. *DAS TIERREICH.*, 29, 1-35.
- Sund, P.N., 1959: A key to the Chaetognatha of the tropical eastern Pacific Ocean. *Pacif. Sci.*, 13(3), 269-85.
- Thomson, J.M., 1947: The Chaetognatha of south-eastern Australia. *Bull. Coun. Sci. Industr. Res. Aust.*, 22, 1-43.
- Tokioka, T., 1959: Observations on the taxonomy and distribution of Chaetognatha of the North Pacific. *Publ. Seto Mar. Biol. Lab.*, 7(3), 349-456.
- Tokioka, T.R. and Pathansali, D., 1963: Another new Chaetognatha from Malay waters with a proposal of grouping some species of *Sagitta* into subgenera. *Publ. Seto Mar. Biol. Lab.*, 11(1), 199-223.

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TABLE 1

COMPARISON OF *S. GUILERI* SP. NOV. WITH *S. NEGLECTA* AIDA

	<i>S. guileri</i> sp. nov.	Alvarino (1967)	Thomson (1947)
Length (mm)	8 - 10.5	8.0	8 - 10
Body	Opaque and strongly built	Firm, rigid, opaque with strong muscles.	-
Head	Normal size, about or less than the widest part of the body.	Regular or small.	-
Eyes	Rounded, pigmented area strong, dark and in the form of a 'T' lying sideways with top part pointing laterally.	Roundish; pigmented area shaped like a five pointed star with three large arms and two small.	-
Intestinal diverticulum	Present.	Appear at the anterior end of the digestive tract.	-
Corona ciliata	Absent (5% Formalin preserved specimens).	Clearly visible, and it extends in a weaving pattern from a location between the eyes to midway from neck to ventral ganglion.	-
Tail %	25.5 - 29.6	26 - 30	27 - 32
Hooks	6 - 7	6 - 7	6 - 8
Anterior teeth	4 - 5	7	5 - 7
Posterior teeth	6 - 9	up to 18	9 - 16
Collarette	Present, extending from head to tail as far as middle region of tail fin. Relatively thicker at the neck and vicinity of seminal vesicle.	Filling neck region to anterior fins and as a thin layer to tip of tail.	-
Anterior fin	Beginning at a distance (approximately 4.0% of the body length) behind ventral ganglion. Shorter than posterior fin and completely rayed.	Beginning a short distance behind posterior end of ventral ganglion; shorter than posterior fin; no rayless zone present.	-
Posterior fin	Long and elliptical in shape; more on the tail region. Posterior end terminates just in front of anterior tip of seminal vesicles. Completely rayed.	Beginning at a short distance behind anterior fins; extending to seminal vesicles; elliptical in shape; located more on tail (2/3 of their length) than trunk; no rayless zone.	-
Ovaries	Long, reaching up into the neck region (one on each side). Ova rounded and large in one row; filling the body cavity.	Wide tubes filling trunk cavity and reaching up to midway between neck and ventral ganglion; ova round, large and arranged in one row.	-
Seminal vesicles	Roundish to triangular in shape; protuberance at the mid-lateral edge; bursts at the mid-lateral edge when mature. Nearer to posterior fin.	Touching end of posterior fins, apart from tail fin; distance of seminal vesicles to tail fin is about equal length of vesicles; roundish with anterior part more voluminous, with a protuberance at anterior end at the base of which a fission line is visible; bursting along that line extending towards lateral edge of dorsal side to posterior end of vesicles.	-

S. neglecta Aida

Tokioka (1959)	Sund (1959)	Michael (1919)	Michael (1911)
6.8 - 8.1	7.3	6.5 - 8	7.9 - 12
-	Firm, semi-opaque.	-	Firm, rigid, retaining its form well.
-	-	-	-
-	-	-	-
-	Present.	-	-
-	-	-	-
28 - 32.4	27 - 31(27.4)	30 - 33.5	26 - 30
6 - 8	6 - 8(7)	6 - 7	7 - 9
5 - 8	5 - 7(5)	4 - 8	3 - 5
13 - 18	13 - 17(17)	12 - 16	8 - 11
-	Present.	-	Extends from neck region to well forward, but never reaches the ventral ganglion.
-	Starts at ventral ganglion.	Three specimens out of 10 specimens studied had the anterior fin beginning 1.0 to 1.5% of the body length behind ventral ganglion. Remaining specimens begin at ventral ganglion.	Shorter and narrower than posterior fin. Extends to posterior end of ventral ganglion. In form it is narrowly and acutely triangular.
-	Reaches seminal vesicles.	Posterior end touching seminal vesicle.	Extends nearly, if not quite to seminal vesicle when seminal vesicles are timid. Half elliptical in form.
-	Containing round ova, extending anterior to posterior border of anterior fin.	-	-
-	Rounded.	-	The seminal vesicles do not present such decided contrast as in <i>S. serratodentata</i> .

