

IDENTIFYING JUVENILE Nereis riisei GRUBE, 1857
(POLYCHAETA: NEREIDIDAE)
TAKEN IN ECOLOGICAL SURVEYS

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ABSTRACT

Materials from ecological surveys are usually sorted on the basis of a morphological "gestalt". Identification is verified on a small sample using standard techniques for the species. Juveniles (and atypically small adults) may lack the characters upon which the "gestalt" is based and thus are sorted as "spp. indeterminate."

Presented are the characters for identifying such specimens of Nereis riisei Grube, 1857, a species found in most surveys from the Caribbean and associated waters. Using these characters, "spp. indeterminate" specimens can be identified, thus increasing the size of the database.

Key words: Polychaeta, Nereididae, Nereis riisei, juvenile, ecological survey.

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INTRODUCTION

Nereis riisei was originally described by Grube in 1857 (pp. 162-163), based on two specimens from St. Croix, West Indies. Although never dominant from the point of view of percentage of polychaetes taken, it has since been reported in a number of ecological surveys from Caribbean and associated waters, e.g., Cuba (Ibarzabal, 1985, pp. 1-27; 1986, pp. 4-5; 1986, p. 8), Venezuela (Arana & Vásquez 1979, pp. 6-7), Colombia (Laverde-Castillo and Gómez, 1987, pp. 95-112), Mexico (Kornicker et al., 1959, p. 20; Salazar-Vallejo, et al., 1988, p. 182), Panama (1977, Fauchald, p. 31), Gulf of Mexico (1984, Taylor, pp. 31-38 through 31-40), and Brazil (Amaral and Nonato, 1975, p. 239),

As expected for the mid-1800's, the description of the type is general and does not include some of the diagnostic characters of the species. The type itself is an incomplete asexual specimen 32 mm long and 4 mm wide with about 63 segments. Augener (1925) indicated that the type was missing the proboscis; it is now also missing some parapodia as well as most setal blades. In addition, the specimen is hardened and cannot be manipulated properly for

study. There is a co-type in similarly bad shape. As part of a search for a neotype from St. Croix (which has not yet been located), material from an ecological survey of the island was examined. Juvenile specimens of Nereis riisei were found and are here described for the first time. Juveniles with as few as 12 setigers can be accurately identified.

METHODS

Methods.- The materials used in this study were made available by the following museums and companies: National Museum of Natural History, Washington, D.C. (USNM), Zoological Museum, University of Copenhagen (ZMUC), Barry Vittor Associates, Mobile, AL (BVA), and Cove Corporation, Lusby, Maryland (CC).

Preserved juvenile specimens were placed in two drops of ethyl alcohol on a glass slide. The alcohol was almost completely withdrawn and replaced with about two drops of Hoyer's mounting medium (Fig 1). A cover slip was placed on the top, and the preparation allowed to dry for 1-2 weeks and then sealed with fingernail polish. Hoyer's Solution clears body tissue so that the setae, jaws, and paragnaths are clearly visible.

Figure 1: HOYER'S SOLUTION		
MATERIAL	WEIGHT	MEASURE/TYPE
Distilled Water	50 g	50 ml
Gum Arabic	30 g	Crystals
Chloral Hydrate	200 g	
Glycerine	20 g	15.9 ml
Materials must be mixed and dissolved at room temperature in the given sequence.		

Measurements were made under the compound microscope with a calibrated grid. Body length was measured from tip of prostomium to the end of the pygidium; for twisted specimens, the grid was rotated along the body. Body width was measured across the dorsal surface of the tenth setiger from the tip of the right notopodium to the tip of the left notopodium.

MATERIALS

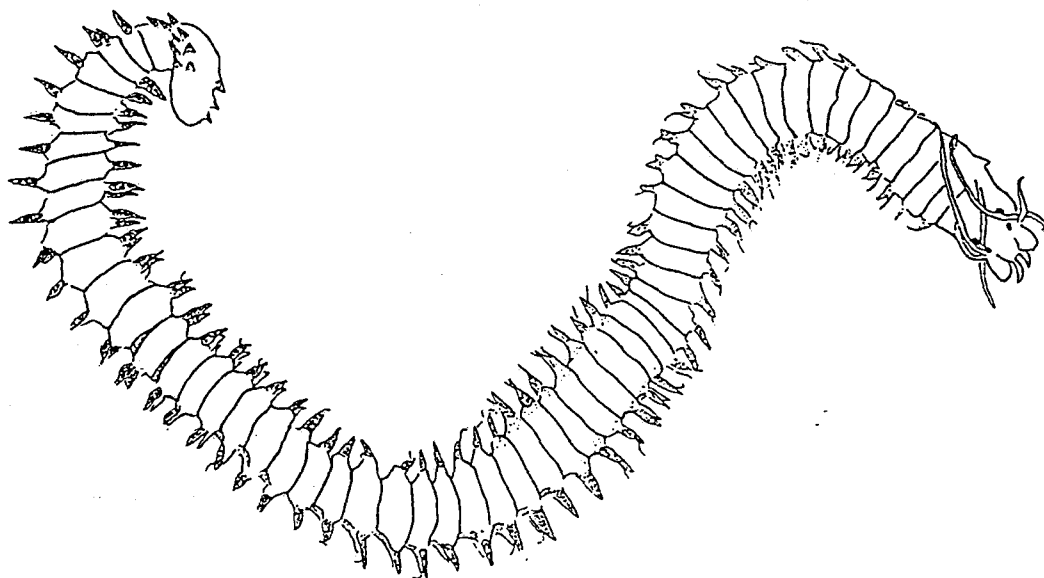
West Indies: St. Croix, "10-9-1845", coll. Krøyer, ZMUC (1 spec.); no further data, coll. Krøyer, ZMUC (1 spec.); 17°40'41"N, 64°46'08-11"W (Sta. 1), 17°40'31"N, 64°46'08"W (Sta. 3) and 17°39'99"N, 64°46'06"W (Sta. 5), Apr. 10, 1993, Van Veen grab, 1/10 sq m, 11-17 m, CC, (28 spec). Puerto Rico, Mayaguez, 30.48m, sand, Aug. 1963, colls. Hulings and Feray, USNM (1 spec.); Laguna Joyuda, 18°07'30"N, 67°10'00"W, 12 Dec. 1978, coll. R. Castro, USNM (1 spec.).

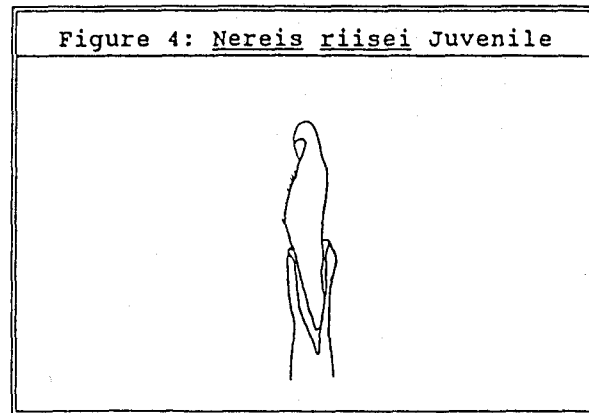
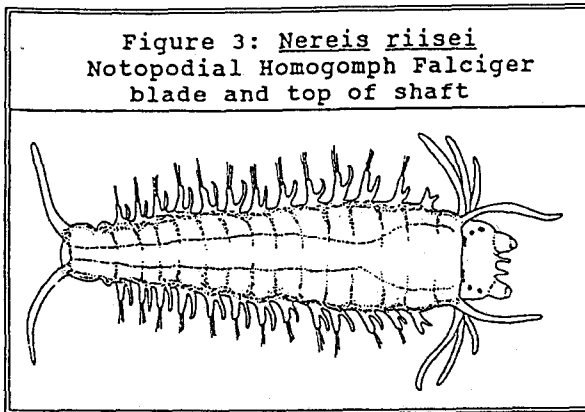
Gulf of Mexico. Colombia, Cartagena, no further data, coll. Gagso, HZM (5 spec.); Northern Gulf of Mexico, no further data, BVA (1 spec.).

CHARACTERS USED FOR IDENTIFICATION OF ADULTS

Specimens were classed as atokous (non-sexual) adults if they lacked characters linked to reproductive activity and possessed a full complement of diagnostic characters; Figure 2 is of a Puerto Rican atoke that is 25 mm long and 2 mm wide. These characters include: (1) notosetae include homogomph falcigers that begin after the first one fourth of the segments but before the median segment--each with a heavy blade imbedded half way into socket at top of shaft; cutting edge with long spines and membrane arching to recurved fang (Fig 3); and (2) oral armature includes one row of large paragnaths adjacent to the oral aperture.

Figure 2: Nereis riisei Atoke





Although this type of notopodial homogomph falciger has not been seen on any other species within the range attributed to Nereis riisei, it is not unique in the Family Nereididae. Therefore, its location along the body may be an additional useful feature in distinguishing this species from others.

Initially, specimens taken in ecological surveys are sorted on the basis of a morphological "gestalt", which includes the presence of dark brown material in the dorsal aspect of the parapodia, no parapodial elongations, parapodia close to the body, and a non-bifid prostomium. As some of these characters need to be checked by dissection and/or examination with a compound microscope, final identification is usually made on a smaller subset of specimens.

The description and illustrations in Taylor (1984, pp. 31-38 through 31-40) are sufficient for checking the accuracy of atokes. Complete atokes ($n = 20$) are 20 to 100 mm long and 1.0 to 5.5 mm wide (including parapodia) and have 62 to 160 segments.

CHARACTERS USED FOR IDENTIFICATION OF JUVENILES

Specimens were classed as juveniles if they had the unique homogomph notopodial falcigers characteristic of adults but lacked a full complement of other diagnostic characters. Figure 4 is a 12 setiger juvenile that is 1.2 mm long and 0.4 mm wide. In order to be sure that specimens lacking this full complement were indeed Nereis riisei, the characters listed in Figure 5 were counted or measured in twenty one complete juveniles. Based on this data, a Pearson Correlation Matrix showed them to be strongly correlated to one another. Therefore, as the juvenile increases in size, each of

these characters also increases in size or number. This increase is not always in a strictly linear fashion since occasional specimens may have less or more of a character than a similarly sized specimen.

Figure 5: <u>Nereis riisei</u> Characters Pearson Correlation Matrix N = 21					
	LENGTH	WIDTH	NUMBER OF SEGMENTS	NUMBER OF PARAG-NATHS	FIRST DIAG-NOSTIC SETA
LENGTH	1.000				
WIDTH	0.819	1.000			
#SEGMENTS	0.984	0.821	1.000		
#PARAG-NATHS	0.727	0.755	0.701	1.000	
1st DIAG-NOSTIC SETA	0.894	0.763	0.912	0.799	1.000

Juveniles range in size from 1.5 to 18.0 mm long and 0.3 to 2.0 mm wide, with 12-70 setigers. Some characters, e.g., peristomial cirri and paragnaths, are seen in various stages of formation. Otherwise, they appear as miniature atokes, except that they less often exhibit the brown pigment so characteristic of adults. Therefore, specimens too small to exhibit the morphological "gestalt" are not always identified in ecological surveys.

VARIATION OF JUVENILE CHARACTERS

Paragnaths:-No paragnaths were seen in juveniles with 12 to 32 setigers. Then their numbers increase to 49 in a 60 setiger specimen. Although it is difficult to assign paragnaths to six of traditional eight proboscoidal areas when specimens are mounted in Hoyer's solution, those in areas VII and VIII are distinguishable because they form a ring adjacent to the oral aperture. At 35 setigers, there are 5 paragnaths in this area, which is within the range expected for an adult (2-7).

Notopodial Homogomph Falcigers:-Twenty-two juveniles were checked for the first setiger on which the first notopodial homogomph falciger appeared. In 15 of these, the appearance was between the

first one fourth of the segments and the median segment, with a range of 25% to 49% of the number of segments, as is the case in adults. However, in seven specimens, it was found more posteriorly, ranging between 53% and 85%.

Peristomial Cirri:—The fourth pair is just forming at the 12 to 13 setiger stage. Therefore, smaller specimens may appear to have fewer than the diagnostic number of peristomial cirri.

Peristomium:—At 13 setigers, two clear internal aciculae are embedded on each side in the posterior, dorso-lateral portion of the peristomium. They could not be found at 70 setigers, suggesting that they are eventually lost. Their presence indicates that, by this stage, the first larval setiger is fused with the posterior part of the peristomium.

Anterior Parapodia:—Since the first larval setiger has, by the 13 setiger stage, fused with the peristomium, the first two juvenile setigers represent larval setigers 2 and 3. The parapodia of these segments are smaller than those immediately posterior and their aciculae are without color, in contrast to those following.

DISTRIBUTION AND HABITAT

We have examined juvenile, atokous and sexual specimens from the Caribbean and associated waters, from the northwest coast of South America and from the Galapagos. Fauchald (1977) identified it on both sides of Panama. Thus it is considered Pan-Neotropical.

The species is found from one to about 30 meters deep, in fine mud to hard bottom (including reefs and mangrove roots) and on suspended plexiglass and boards. Fauchald (1977) considers it restricted to warm water.

Foraminifera and diatoms are seen in the gut in smaller juveniles; in larger specimens, there are also nematodes and copepods, which indicates that the juveniles are benthic.

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