Nerillidae of Hawai‘i: Two New Records of Interstitial Polychaetes

JULIE H. BAILEY-BROCK

ABSTRACT: Two species of the polychaete family Nerillidae are reported from sand collected from the south shore of O‘ahu, Hawai‘i. *Nerilla antennata* O. Schmidt was collected from a shallow fringing reef, and *Mesonerilla fagei* Swedmark with coarse sand from Honolulu Harbor. Both are less than 0.5 mm in length and occupy an interstitial habitat. *Nerilla antennata* has a broad geographic distribution including Atlantic, Pacific, and Indian Oceans, and *M. fagei* is known from the North Atlantic. The morphology of Hawaiian specimens is described and reproductive stages of *M. fagei* are illustrated.

**RESULTS**

Two nerillid genera were found in the meiofaunal (0.25 mm) sieve fraction, *Mesonerilla* from Honolulu Harbor and *Nerilla* from Niu beach park. These genera are distinguished from each other by their setae. The former has compound setae, the latter simple setae with fine serrations along one margin of the blade. The genera share a number of characteristics and a brief generic diagnosis is given for each.

Genus *Nerilla* O. Schmidt, 1848

**DIAGNOSIS** (after Westheide 1990): Nerillidae with three jointed antennae, two palps, nine setigers including the buccal segment, all parapodia with simple setae. First setiger with a pair of jointed parapodial cirri, se-

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1 Manuscript accepted 29 October 1998.
2 Department of Zoology, University of Hawai‘i at Mānoa, 2538 The Mall, Honolulu, Hawai‘i 96822.
**Nerilla antennata** O. Schmidt, 1848

Body of live specimen (Figure 1a) with nine setigers, three long antennae, a pair of palps, and a pair of anal cirri. Eyespots each composed of two reflective oscelli, nuchal organs narrow slits just posterior to the palps. Antennae extend a distance equal to that between the first and second setigers and are weakly articulated. At rest, setae of setiger one are straight, lie parallel to the body, and are directed posteriorly; when the worm crawled they were moved rapidly in a 180° arc and projected forward and then backward. A single seta in each parapodium of setiger one moved independently of the others. Cirri of setiger one are almost as long as the antennae and weakly articulated with five articles. Setigers two to nine with long, slightly curved setae. Parapodial cirri and setae directed laterally and posteriorly. Setae of setigers seven and eight are more numerous than those of anterior segments. Anal cirri with three to five articles. Pharyngeal apparatus could be seen moving, which changed the diameter of the buccal region, but buccal pieces were not recognizable with light mi-
Mesonerilla fagei Swedmark, 1959

Description of Hawaiian material based on preserved specimens. Body with nine setigers (Figure 2a). Prostomium with three smooth or slightly wrinkled antennae (Figure 2a,b) extending in length to the second setiger and a pair of club-shaped, laterally directed palps. Buccal pieces and eyes were not observed. Parapodia of first setiger lie just posterior to the palps and have clearly defined dorsal and ventral bundles of compound setae. Setigers two to nine similarly organized with compound setae. A single interramal cirrus on each parapodium, the longest cirri on setiger eight and/or nine. First setiger cirri are notably shorter than those of setigers two to nine (Figure 2b). Posterior region without anal cirri (Figure 2c), and in some specimens two developing embryos obscure the dorsum of the terminal segment (Figure 2a). Another specimen was found with a six-setiger juvenile attached to the last segment (Figure 2d). Setae are all compound (Figure 2e), each with a slender smooth blade and boss at the
tip of the shaft. Blades of some setae are conspicuously longer than others. Number of setae per parapodium varies along the body, with most in the posterior setigers. Setal counts for one specimen are as follows: setiger one with 18 setae, two with 11–13, three and four with 17, five with 14–18, six with 18–21, seven with 29, eight with 21, and nine with 12–14. Ciliary tufts are present on anterior and lateral margins of the palps, at the bases of antennae and parapodia, along the body, and on the pygidium (Figure 2a,b,c). One tuft of cilia could be seen between parapodia (Figure 2a,b).

HABITAT: Numerous specimens were found in coarse sand collected from a slope on 17 November 1997 at 3 to 5 m depths in Honolulu Harbor, south shore of O'ahu.

GEOGRAPHIC RANGE: *Mesonerilla fagei* is known from the English Channel and Irish Sea (Westheide 1990).

REMARKS: The Hawaiian material of *M. fagei* fits the description in Westheide (1990) except that the buccal setae point laterally in fixed specimens and anal cirri were not observed. Buccal pieces could not be distinguished. *Mesonerilla fagei* is hermaphroditic.
and is sexually mature in temperate latitudes during the summer months (Westheide 1990).

*Mesonerilla fagei* resembles *M. intermedia* Fransen, which has a geographic range that includes the northwestern and northeastern Atlantic and Mediterranean Sea, except that *M. fagei* has short cirri on setiger one and longer cirri on setigers two to nine, whereas those of *M. intermedia* are the same length. *Mesonerilla intermedia* has a dorsal brood hood (Fransen 1983), but *M. fagei* does not produce one. *Mesonerilla fagei* resembles *M. ecuadoriensis* Schmidt & Westheide, 1977, which is known from the Galápagos Islands, except that these two species differ in the length of first setiger parapodial cirri. *Mesonerilla fagei* has short anal cirri; *M. ecuadoriensis* has long cirri.

**DISCUSSION**

Taxonomic work on the Nerillidae is challenging because of their small size, which is near the limits of light microscopy, and the fragile nature of these polychaetes. Important features that usually cannot be successfully resolved in preserved material include the ventral ciliary fields, but these are only occasionally mentioned in species diagnoses, and more importance is placed on larger structures.

Species identification may require determining the sex of the worm. Sex organs are in the last three or four segments, and in some genera both gonochoristic and hermaphroditic species are known. Methods of brooding embryos, attached to the terminal segment in *Mesonerilla fagei* and under a dorsal hood in *Mesonerilla intermedia*, are possibly adaptations to small body size and living in an interstitial habitat. Such methods of brood protection constrain brood size, result in low fecundity, and may be a response to an unstable habitat. Attachment of developing young to the parent indicates that considerable parental investment and retention of young within the parental population occur. *Nerilla antennata* is gonochoristic and males leave spermatophores attached to the substratum. Females lay eggs nearby and young develop under a mucus cover within a few days. Absence of a pelagic larval stage from the life cycle, direct development, and recruitment to the parent population indicate that other means of dispersal are required to ensure survival of a population at any location. Life cycle stages and longevity are known for a few temperate-latitude species (Westheide 1990), and Hawaiian nerillids may also be semicontinuous reproducers with a short life span lasting a few months.

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**LITERATURE CITED**


