Key to the Paraonidae (Annelida: Polychaeta) reported from the City of San Diego Ocean Monitoring program with description of 7 provisional species\(^1\) (revised July, 2006)

Family Paraonidae Cerruti, 1909

<table>
<thead>
<tr>
<th>Aricidea (Acmira) catherinae</th>
<th>Laubier, 1967</th>
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<tr>
<td>Aricidea (Acmira) cerrutii</td>
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<td>Aricidea (Acmira) horikoshii</td>
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<td>Aricidea (Acmira) lopezi</td>
<td>Berkeley &amp; Berkeley, 1956</td>
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<td>Aricidea (Acmira) simplex</td>
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<td>Aricidea (Acmira) sp SD1 fide Barwick, 1999</td>
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<td>(^3)Aricidea (Acmira) sp SD2 fide Barwick, 2006</td>
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<td>Aricidea (Aedicira) pacifica</td>
<td>Hartman, 1944</td>
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<td>Aricidea (Allia) antennata</td>
<td>Annenkova, 1934</td>
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<tr>
<td>Aricidea (Allia) hartleyi</td>
<td>Blake, 1996</td>
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<td>(^4)Aricidea (Allia) monicae</td>
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<tr>
<td>(^5)Aricidea (Allia) quadrilobata</td>
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<td>(^6)Aricidea (Aricidea) sp SD3 fide Barwick, 2006 [(^6)Aricidea (Aricidea) longobranchiata of CSD not Day, 1961]</td>
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<td>Cirrophorus branchiatus</td>
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<td>Cirrophorus furcatus</td>
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<td>Levinsenia oculata</td>
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<td>Paradoneis eliasoni</td>
<td>Mackie, 1991</td>
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<td>Paradoneis lyra</td>
<td>(Southern, 1914)</td>
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<tr>
<td>Paradoneis spinifera</td>
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<tr>
<td>(^3)Paraonella platybranchia</td>
<td>(Hartman, 1961)</td>
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1 Based on a draft of the “Key to the Paraonidea (Annelids: Polychaeta) reported from the Southern California shelf with description of 4 new provisional species” by Larry Lovell and Kelvin Barwick.

2 Reported in the SCAMIT (2001) species list but not reported from the CSD program and not included in key. See Strelzov, 1973 for description.

3 Species added to July, 2006 revision.

4 Reported in the SCAMIT (2001) species list but not reported from the CSD program.
Paraonidae
K. Barwick
May, 2000
Revised July, 2006

Prostomium with median antenna

Prostomium without median antenna

Page 10

Median antenna terminally branched from single stalk

Median antenna not branched

Page 2

A. (Allia) sp A

A. (Aricidea) wassi

Median antenna multiarticulated [also compare to A. (Aricidea) sp SD1 page 9]

Median antenna not multiarticulated

Page 12

Modified setae present in neuropodia, notopodia or both fascicles

Modified setae absent

Page 3

Modified setae notopodial (lyrate, ankylose) Fig. 5 & 6

Modified setae neuropodial (various types)

Page 10

Modified notosetae ankylose begin in branchial region, primary shaft can be thinner in posterior segments

Cirrophorus branchiatus

Cirrophorus furcatus

Modified notosetae lyrate; ankylose setae not present; often entire worm is pigmented red

Blake, 1996
Strelzov, 1973
Imajima, 1973
Hartman, 1957
Strelzov, 1973
Paraonidae

K. Barwick

May, 2000

Revised July, 2006

Modified setae neuropodial (various types)

[Continued from Page 2]

Postsetal neuropodial lobes poorly developed (tuberculate) or absent

With postsetal neuropodial lobes well developed in some anterior branchial setigers (digitiform)

Page 5

Modified neurosetae with distal short hairs or arista and/or subterminal hood

Modified neurosetae without arista or hood; naked distally

Branchiae straight running toward midline of dorsum, held closely to body; modified neurosetae falcate, stout

A. (Acmira) simplex

Branchiae curved toward midline of dorsum, held erect over dorsum; modified neurosetae thin curved spines

A. (Allia) sp SD1

Page 6

Page 4

Modified neurosetae without hood

Modified neurosetae with hood
Paraonidae
K. Barwick
May, 2000
Revised July, 2006

Modified neurosetae with hood
[Continued from Page 3]

Antenna short, digitate, not reaching past setiger 1; modified setae with subterminal hood, terminal arista absent

* A. (Acmira) cerrutii

Median antenna clavate; 9 - 25 pairs of branchiae [also compare with *A. (Acmira) lopesi* page 8, Table 1]

* A. (Acmira) catherinae

Antenna long, tapering reaching to setiger 3 - 4; 26 - 28 pairs of branchiae [also compare to *A. (Aricidea) sp SD2* page 7]

* A. (Aricidea) sp SD3

Antenna reaching past setiger 1, clavate or filiform; modified setae with subterminal hood and terminal arista
Postsetal neuropodial lobes well developed, digitiform, in some anterior branchial setigers  
[Continued from Page 3]  

One long, digitiform postsetal neuropodial lobe present in some anterior setigers; median antenna long extending well past setiger 1

1-3 short, digitiform postsetal neuropodial lobes present on setigers 6-16; median antenna cirriform not extending past posterior margin of prostomium

*A. (Allia) monicae*

Postsetal notopodial lobes bifurcated in some anterior-branchial setigers; median antenna long extending to setiger 5-9; modified notosetae bent tip acicula with or without terminal arista, some with fine hairs at distal end of spines

*A. (Allia) antennata*

Postsetal notopodial lobes not bifurcated; median antenna extending to setiger 4-5; modified setae with “distally curved tip which is covered by short cilia and has a narrow guard along the convex side of the shaft” (Imajima, 1973)

*A. (Acmira) horikoshii*
Modified neurosetae without hood

[Continued from Page 3]

Modified neurosetae with hooked tip

Modified neurosetae with straight tip

At least some modified setae with terminal or subterminal arista; median antenna not club shaped

Modified neurosetae slightly curved, distally hooked with subterminal constriction, without arista, but with short hairs; median antenna short, club shaped

*A. (Acmira) sp SD1*

Median antenna clavate with bottle shaped tip, reaching to setiger one; modified neurosetae range from pseudoarticulate to weakly hooked, with or without single terminal arista

*A. (Aricidea) pseudoarticulata*

Median antenna not clavate; some modified setae with terminal and subterminal arista

Page 9

Page 7

Hobson, 1972
Median antenna not clavate; some modified setae with subterminal arista

[Continued from Page 6]

Median antenna with a broad base tapering to filiform tip reaching setiger 4 - 5; modified setae with facate tip, distally with or without a subterminal arista, some setae with short hairs at base of arista or along concave margin of tip [also compare to *A. (Aricidea)* sp SD3 page 4]

*A. (Acrida)* sp SD2

Median antenna shorter, digitform, not reaching past setiger 2

Page 8
With minute, bulbous extra papillae located dorsal to notopodial lobe in middle branchial region

*A. (Acmira) rubra*

Without minute, bulbous extra papillae in middle branchial region [also compare with *A. (Acmira) catherinae* page 4, Table 1]

*A. (Acmira) lopezi*
Each modified setae with terminal arista only (maybe worn or absent); inserted late in the post branchial region (setiger 45 - 50); median antenna short, blunt; 11 - 13 pairs of branchiae

*A. (Allia) hartleyi*

Each modified setae with subterminal arista; median antenna filiform, reaching to setiger 1; 18-33 pairs of branchiae

*A. (Aricidea) wassi* [also compare to *A.(Aricidea) sp SD1*

Take to specialist for further ID
Paraonidae

Prostomium without median antenna

[Continued from Page 2]

Modified notopodial setae consist of a single curve spine in mid-body notopodia; up to 4 spines per fasicle in more posterior setigers

*Paradoneis spinifera*

Modified notopodial setae lyriform or absent

Modified notosetae present, lyriform

Modified notosetae absent

Page 11

One or more spines in some posterior neuropodia

Acicular spines absent in all posterior setigers, modified setae lyrate (entire specimen necessary for specific ID)

*Paradoneis lyra*

Single curved spines present in some posterior neuropodia, no terminal arista

*Paradoneis eliasoni*

Multiple curved spine present in some posterior neuropodia, many with a terminal arista

*Paradoneis sp SD1*
Modified notosetae absent
[Continued from Page 10]

Branchiae long and filiform
*Levinsenia multibranchiata*

*Levinsenia gracilis*

Stout curved neuropodial spines in a single row and of one type, stout curved; body without methyl green lateral spots postbranchially

Modified neurosetae without hood

Modified neurosetae with strongly curved tips with subterminal hood; first 4-5 setigers slightly more inflated than subsequent setigers; branchiae spatulate

*Levinsenia sp. SD1*

Branchiae short

stout curved and slender, tapered neuropodial setal spines; with methyl green stain spots on postbranchial setigers

*Levinsenia oculata*
Paraonidae
K. Barwick
May, 2000
Revised July, 2006

Prostomium truncate external laterally, median antenna extending to setiger 2 - 4; 30–66+ branchial pairs; last few pairs with brad base tapering to long filiform tip

A. (Aedicira) pacifica

Modified setae absent

[Continued from Page 2]

Prolonged, conical prostomium conical; median antenna absent; 25 - 29 branchial pairs; branchiae broad, flat, and distally pointed

Paraonella platybranchia
Literature Cited


Table 1 - Additional characters for separating Aricidea (Acmira) catherinae from A.(A.) lopezi (Presonal communication L. Lovell March 7, 2006)

<table>
<thead>
<tr>
<th>Character</th>
<th>catherinae</th>
<th>lopezi</th>
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<tr>
<td>Relative length of branchiae</td>
<td>Increases toward posterior</td>
<td>Subequal through out</td>
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<tr>
<td>Antennae length</td>
<td>Reaching to setiger 1-3</td>
<td>Reaching to just past setiger 1*</td>
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<tr>
<td>Modified neurosetae shape and arrangement</td>
<td>Individual setae more curved in ventral part fascicle</td>
<td>No change in setal shape through out fascicle</td>
</tr>
<tr>
<td>Modified neurosetae number per fascicle</td>
<td>9-10</td>
<td>7-8</td>
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* It was incorrectly drawn in MMS Atlas (Vol. 6, Fig. 2.15A, pg. 58). Larry has seen the type. This is the same image used in the in-house key.
Species: *Aricidea (Acmira)* sp SD1

**Authority:** Barwick, 1999

**Common Synonyms:** None known

**Taxon:** Polychaeta: Paraonidae

**Date:** May 1999 (2nd revision April 2006)

**By:** K. Barwick

**Voucher Specimen(s):**

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<td>7/22/98</td>
<td>25m</td>
<td>CSD / P-70</td>
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**Full Description:** (14 specimens examined, one entire)

- Antenna short, does not reach past posterior of prostomium; club shaped (Fig. 2 & 4)
- 12 pairs of branchiae; start on setiger 4
- Branchiae with broad base, tapering to filiform tips; last two pairs much reduced in size with the last pair being smallest (Fig. 2)
- Prostomium rounded, triangular with nuchal slits present; pigment present on some specimens (Fig. 4)
- Postsetal notopodial lobes present from setiger one, start as short and tuberculate; transition through branchial region to filiform in the postbranchial setigers
- No postsetal neuropodial lobes
- Modified postbranchial neuropodial setae with a slight curve and distal hook; slight constriction and short hairs distally (Fig. 1)
- Pygidium with two filamentous anal cirri (Fig. 5)
- Rust colored pigment on most animals (often faded to light speckling) (Fig. 3)

**Comments:**

The modified setae most closely resemble *Aricidea (Acesta) finitima* Strelzov, 1973 (pg. 113, fig. 41e & f). Also see figure 2-36c in Gaston, 1984. This species has been synonymized with *Aricidea (Acmira) rubra* Hartman, 1963 (Blake, 1996). The median antenna of *Aricidea (Acmira)* sp. SD1 is shorter than the median antenna of *Aricidea (Acmira) rubra*. *A. (Acmira)* sp. SD1 has considerably fewer pairs of branchiae and has at least some pigment in preservation. The specimens examined also lack the “extra papilla located dorsal to the podial lobe.” described for *A. (Acmira) rubra* by Blake (1996).

**Distribution:**

Only known from voucher locations (see above). Stations are located east and south of Santa Cruz Island.
Additional Illustrations: (K. Barwick)

Fig. 3 Anterior A. Dorsal view B. Ventral view (CSD/P-70)

Fig. 4 Prostomium dorsal view

Fig. 5 Pygidium

Literature Cited:


Species: *Aricidea (Acmira)* sp SD2
Authority: Barwick, 2006
Common Synonyms: None known

Full Description: (3 incomplete specimens examined)
- Antenna reaching to setiger 4 - 5; slightly clavate with long filiform tip (Fig 1A)
- 17 - 19 pairs of branchiae; start on setiger 4
- Branchiae with broad base, tapering to long filiform tips on posterior branchial setigers; second to last branchia longest, nearly twice the length of the anterior most (Fig 1C & 2)
- Prostomium triangular, rounded terminally, dorsum of prostomium with nuchal slits anterior to lateral eyespots near posterior margin (Fig 1A)
- Postsetal notopodial lobes present from setiger one, start as tuberculate; transition through branchial region to filiform in the postbranchial setigers
- No postsetal neuropodial lobes
- Modified postbranchial neuropodial setae with falcate tip, distally with or without a subterminal aristae, some with short hairs at base of arista or along the concave margin of the tip(Fig 1B & 3)
- Pygidium unknown
- Body of two specimens with light speckling of pigment on lateral edge of each parapod, on edges of each branchia and the anterior dorsum of branchial region (Fig 2)

Illustrations: (K. Barwick)

Fig 1 A. Prostomium dorsal view, B. modified postbranchial neurosetae C. Anterior dorsum Scale bar = 1 mm (Specimen from DB14)

Comments:
The anterior of *A. (A.)* sp SD1 most closely resembles the illustration of the holotype *A. (Acmira) lopezi* in Blake (1996) (Fig. 2.15A). However L. Lovell states that he has seen the type for *A. lopezi* and the actual antenna is much shorter, reaching only to setiger one (personal communication March, 2006). The modified setae can be confused with *A. (Acmira) catherinae* and *A. lopezi*. The actual morphology of the setae is difficult to resolve, exactly. The limited records of *A. (A.)* sp SD2 are from over 500 meters depth and the unique combination of characterrs warrant erecting this provisional..

Distribution:
Only known from voucher locations (see above). 500+ meters.
**Polychaeta: Paraonidae**

*Aricidea (Acmira)* sp SD2 Barwick, 2006

**Additional Illustrations:** (K. Barwick)

![Fig. 2](image1.png)

Fig. 2 A. Anterior ventrum, B. Anterior dorsum (Specimen from DS1)

![Fig. 3](image2.png)

Fig. 3 Modified postbranchial neurosetae 1000x (A, B & E. Station DS1; C, D, F & G Station DB14)

**Literature Cited:**

**City of San Diego Provisional Voucher Sheet**

**Species:** *Arcidea (Allia)* sp SD1  
**Authority:** Barwick, 2000  
**Common Synonyms:** *Allia* sp SD1

**Taxon:** Polychaeta: Paraonidae  
**Date:** April 5, 2000 (Revised April, 2006)  
**By:** K. Barwick

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<td>Pt. Loma A12(2) (165 ft.)</td>
<td>1/26/90</td>
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**Full Description:** (based on examination of 4 incomplete specimens)

1. Prostomium rounded, smaller in diameter than succeeding segments, giving it a slight shrunken look in some specimens (Fig. 1)

2. Median antenna present, short blunt, club shaped, does not reach to setiger 1 (Fig. 1)

3. Branchiae begin on setiger 4; 23–27 pairs, filiform, recurved up over dorsum, the tips pointed laterally (Fig. 2)

4. Some neurosetae modified in posterior of animal, short curved setae with sharp tips (Fig. 4) mixed with capilaries (Fig. 3 & 5)

5. Postsetal notopodial lobes short, digitiform in prebranchial segments to filiform in branchial region and, finally, thin, threadlike in the postbranchial region

**Illustrations:** (K. Barwick)

- Fig. 1 — Dorsal-lateral view of the anterior (R. Rowe)
- Fig. 2 — Dorsal view of median branchial setigers (R. Rowe)
- Fig. 3 — Postbranchial neuropodia with modified setae (K. Barwick)
- Fig. 4 — Detail of typical postbranchial modified neurosetae (K. Barwick)

**Comments:**

Two morphs of the posterior branchial region have been observed. In one form the branchiae end abruptly with little differentiation from the proceeding branchiae. In the other form the last few branchiae shorten gradually to tiny tubercles before disappearing. Modified setae found on only two of the four specimens examined.

**Distribution:**

Collected at: Pt. Loma A-12 (165ft), Pt. Loma A-14 (150ft.), & ITP I-6 (87ft.)
Polychaeta: Paraonidae
Aricidea (Allia) sp SD1 Barwick, 2000

**Additional Illustrations:** (K. Barwick)

Fig. 5 — modified neuroseate [Regional Station 2729, 6JUL00, 142 ft.]
**City of San Diego Provisional Voucher Sheet**

**Species:** *Aricidea (Aricidea)* sp SD1  
**Authority:** Barwick, 2000  
**Common Synonyms:**  
*Arididea* sp SD1 Barwick, 1996

**Taxon:** Polychaeta: Paraonidae  
**Date:** April 5, 2000  
**By:** K. Barwick

**Voucher Specimen(s):**

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**Full Description:** (modified, in part, from an unpublished draft of a SCAMIT voucher sheet by L. Lovell and K. Barwick)

1. Median antenna reaches to setiger 1, bluntly rounded (Fig. 1)
2. Modified post-branchial setae straight spines tapering to a central point with a subterminal arista, begin on setiger 22-30, up to 16 per fascicle, some setae with clump of fimbriae at inner junction of arista and main shaft (Fig. 2)
3. 18-31, one with 33, pairs of branchiae. Tips of individual branchial pairs meet dorsally, last few pairs reduced
4. Postsetal notopodial lobes papillaform on setigers 1 and 2 and digitiform from setiger 3
5. Pygidium with dorsal lobe and 2 anal cirri and base with anal opening just below.

**Illustrations:** (K. Langan)

- Fig. 1 — Anterior - Dorsal view
- Fig. 2 — Modified postbranchial neurosetae, 1000X

**Comments:** (modified, in part, from an unpublished draft of a SCAMIT voucher sheet by L. Lovell and K. Barwick)

This animal most closely resembles *A. (Aricidea) wassi* Pettibone, 1965. *A. (Aricidea)* sp SD1 differs in two respects: (1) the antenna lacks any articulations, and (2) the modified postbranchial neurosetae taper evenly to straight tips, not curved as in *A. (A.) wassi*.

**Distribution:**

Collected at ITP Station: 2016 (80 ft.)
Aricidea (Aricidea) sp SD3

Species: Aricidea (Aricidea) sp SD3
Authority: Barwick, 2006

Taxon: Polychaeta: Paraonidae
Date: April, 2006
By: K. Barwick
Voucher Specimen(s):

Station | Date | Storage Location/#
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SBOO 6(1), 86 ft | 23JUL97 | DLZ/2028
SBOOI4(2), 18 m. | 12JUL05 | Main/TBA

Full Description: (Based on 3 incomplete specimens. Adapted from preliminary voucher sheet A. (Aricidea) cf. longobranchiata by R. Rowe, 11/6/97)

- Median antenna long, reaching to setigers 3 - 4, proximal third of length slightly broader than rest tapering quickly to a long filiform tip (Fig. 1A, 2A)
- Modified postbranchial neurosetae falcate with subdistal hood and terminal arista(Fig. 1B, 2B-C)
- 26 - 28 pairs of branchiae, last few pair are longer with tapering tips
- Postsetal notopodial lobes range from digitate anteriorly to filiform posteriorly, neuropodial lobes absent.
- Eye spots absent
- Nuchal openings deep oval pits (Fig. 1A, arrows)

Illustrations: (K. Barwick)

Fig. 1 A. Anterior - dorsum, B. Modified postbranchial neurosetae 1000x (specimen from I4(2))

Comments:

Aricidea longobranchiata Day, 1961 was originally described from South Africa. Blake and Wallton (1977) describe something with the same name from the Gulf of Faralones off San Francisco Bay. They noted a couple of small differences from Day’s original description. Their northern Californian specimens: had a greater number of branchial pairs (up to 27), eyespots, and “segmental red pigment spots at the base of some anterior branchiae” (Blake and Walton, 1977). Day describes A. longobranchiata as having acicular setae with “unidentate tips and fine tapered guard or aristae arising just below the tips” (Day, 1961).(Fig. 3) L. Lovell believes that records for A. longobranchiata for the Southern California Bight are in error. (Personal communication March, 2006)

The specimen described here differs from both the South African form and the northern California form in that the postbranchial neurosetae have a subterminal hood with a terminal arista. They also lack eyespots. The previous version of this voucher sheet had reported eyespots as being present. Upon re-examination no eyespots were found. It is possible that the nuchal openings may have been miss interpreted as eyespots.

Distribution:

Know from one specimen at 86 ft and 2 specimens from 18 m, all from the SBOO.
Additional Illustrations:

Fig. 2 A. Prostomium dorsal view, B - C. Modified postbranchial neurosetae 1000x (specimen from I4(2)) (K. Barwick)

Fig. 3 Modified postbranchial neurosetae of A. longobranchiata
(modified from Blake and Walton, 1977)

Literature Cited:


City of San Diego Provisional Voucher Sheet

Species: *Levinsenia* sp SD1
Authority: Barwick, 2000
Common Synonyms:

Taxon: Polychaeta: Paraonidae
Date: April 5, 2000
By: K. Barwick

Voucher Specimen(s):

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Full Description: (Based on single anterior fragment, lost)

1. Prostomium elongated, conical. (Fig. 1)
2. 8 pairs of branchiae begin on setiger 7
3. Branchiae flattened with broad rounded tips, spatulate (Fig. 2)
4. Postbracial neurosetae acicular, distally falcate with subdistal hood (Fig. 3)
5. First 4 - 5 setigers slightly more inflated than subsequent setigers (Fig. 1)

Illustrations: (K. Barwick)

Fig. 1 — Anterior - Dorsal view
Fig. 2 — Branchiae from: A. segment 10, B. segment 9
Fig. 3 — Modified postbranchial neurosetae

Comments:
Most closely resembles *Levinsenia* sp 1 Lovell, 1997.

Distribution:
Collected at ITP Station: I9 (94ft.)
**City of San Diego Provisional Voucher Sheet**

**Species:** Paradoneis sp SD1  
**Authority:** Barwick, 2000  
**Common Synonyms:**

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**Taxon:** Polychaeta: Paraonidae  
**Date:** April 5, 2000  
**By:** K. Barwick  
**Voucher Specimen(s):**

<table>
<thead>
<tr>
<th>Station</th>
<th>Date</th>
<th>Storage Location/#</th>
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</thead>
<tbody>
<tr>
<td>Bight '98 2088 (40.6m)</td>
<td>7/24/98</td>
<td>Main/P318</td>
</tr>
<tr>
<td>Pt. Loma A12 (161 ft.)</td>
<td>7/10/87</td>
<td>Main/P318</td>
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</tbody>
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**Full Description:**

1. Prostomium short, rounded with two nuchal slits (Fig. 2)
2. Median antenna absent
3. Branchiae begin on setiger 4, 6-8 pairs
4. Notopodia with single furcate seta per fascicle
5. Modified neurosetae present in far posterior setigers, short curved curved spines with or without terminal arista, several present per fascicle (Fig. 1)
6. Postsetal notopodial lobes digitate in the post branchial region to end of animal, slightly longer in the posterior most setigers with the longest on the last setiger, see Mackie (1991)
7. Pygidium with three anal cirri

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**Comments:**

This animal is very similar to *P. eliasoni* Mackie, 1991. The main difference between the two is that *P. eliasoni* is described as having only “single curved hooks” in posterior neuropodia. *P. sp. SD1* has numerous (2 or more) curved spines per fascicle many with terminal arista. Specimens in the Pt. Loma voucher collection labeled *P. eliasoni* were all determined to be *P. sp SD1.*

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**Distribution:**

Collected at Bight ‘98 stations 2088 (Catalina Island 40.6m), 2472 (Channel Islands 25m), & 2493 (44m); ITP station 2137 (157ft.), & Pt. Loma station A12 (161 ft.)

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**Literature Cited:**