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METACYCLOPINA IMPROVISA, NEW SPECIES
(COPEPODA: CYCLOPOIDA) FROM THE SOUTHEASTERN
UNITED STATES CONTINENTAL SHELF

Hans-Volkmar Herbst and Zinntae Zo

ABSTRACT

During a study of the meiofauna of the southeastern United States continental shelf in 1977, a new species of *Metacyclopina* (Copepoda: Cyclopoida) was found in the top 15 cm sediment in many locations off South Carolina and Georgia. This new species, *Metacyclopina improvisa*, is described and compared with three other known species. A species key to males and females is included.

ZUSAMMENFASSUNG

Auf 9 Dauerpräparaten befinden sich 7 Weibchen und 4 Männchen einer *Metacyclopina*, die mit keiner der bisher bekannten Arten identisch ist. Die Tiere wurden vom Ecological Services, Texas Instruments Incorporated, am Kontinentalschelf des Atlantik der südöstlichen Vereinigten Staaten gesammelt. Die Weibchen besitzen die für das Genus typische schlanke Gestalt. Die beiden Antennenpaare und alle Mundgliedmassen stimmen in ihrem Bau, der Gliederzahl und der Bewehrung mit denen der bereits beschriebenen Arten überein. Das Analoperculum ist deutlich gezähnt. Das Endglied des Endopoditen 4 trägt beim Weibchen nur drei Borsten. Die Breite und Bewehrung des Endgliedes P5 unterscheidet die neue Art von den bisher bekannten. Das Männchen zeigt ebenfalls die typischen Merkmale der Gattung. Sein Analoperculum besitzt weniger und gröbere Zähne. Das Endglied des Endopoditen 4 trägt, wie üblich, vier Borsten. Die Anordnung der Borsten und Dornen am viergliedrigen P5 weicht von der der bekannten Arten ab. Die neue Art wird unter der Bezeichnung *Metacyclopina improvisa* sp. n. beschrieben und abgebildet. Ein kurzgefasster Schlüssel soll die Bestimmung der Weibchen und Männchen der vier bis jetzt bekannten Arten ermöglichen.

During a study of the meiofauna of the southeastern U.S. continental shelf in 1977, benthic organisms were collected seasonally (February, May, August, and November) with a box-core sampler ($20 \times 30 \times 45$ cm³) at 47 stations on 7 transect lines (Fig. 1). Three subcores were taken from each sample using a stainless steel corer (2.54 cm diameter and 15 cm long) and preserved on board in 8 percent formaldehyde buffered solution. In the laboratory the samples were washed through a 63 μ m mesh sieve and up to 100 copepods (mostly harpacticoids) from each subcore were sorted out under a dissecting microscope. Most specimens were mounted on slides with Hoyer's mounting medium for identification. Many individuals of *Metacyclopina* were found in the majority of the sampling stations (namely, transect line 1, C and F; 2, B-H; 3, A-E; 4, C-E; 5, B-H; 6, E-G; 7, B-C). The specimens used for the description of this new species were collected on February 14 at 2E, 3C; May 7 at 2B, 2C; May 11 at 2C; August 23 at 3C; and August 28 at 4E. The sediment size of these stations was mostly from medium to coarse sand (0.25-1.0 mm), particularly for those in the midshelf area. Stations toward the shelf edge usually contained more clay.

One species of *Metacyclopina* among the cyclopoids could not be identified with any of the known species so far. This new species, *Metacyclopina improvisa*, is described here and compared to the three known species in the genus. The drawings were made with a camera lucida. The abbreviations used are: A1, A2: antenna 1 and 2; B2: basipod segment 2; CR: caudal ramus; EN3: endopod 3rd segment; EX3: exopod 3rd segment; GENS: genital segment; LG: length; P1,

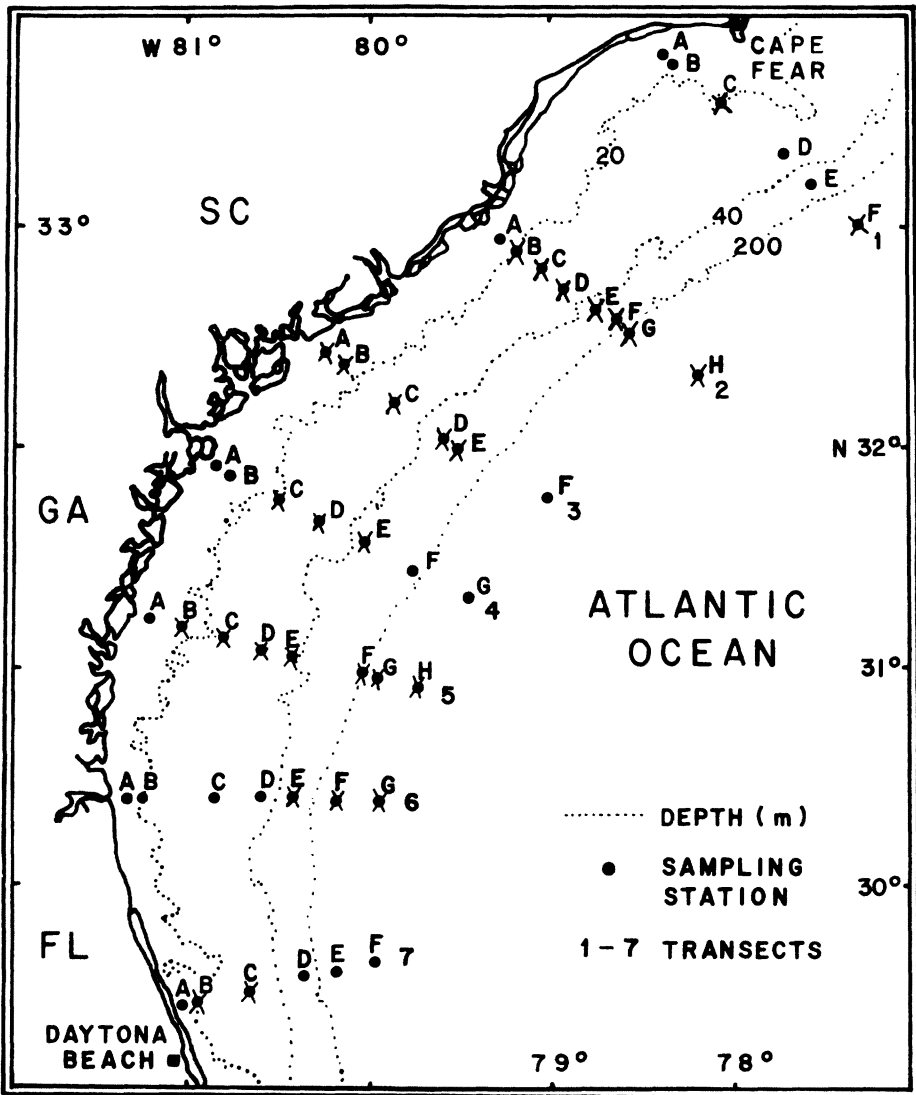


Fig. 1. Sampling area showing the station locations on the southeastern U.S. continental shelf. Those stations where *Metacyclops improvisa*, new species, was found are indicated by X.

P2, etc.: 1st leg, 2nd leg, etc.; SEG1, SEG2, etc.: 1st segment, 2nd segment, etc.; SET: seta(e); SPN: spine(s); and WD: width.

Metacyclops improvisa, new species

Figs. 2, 3

Material.—7 ♀♀, 4 ♂♂: Holotype 1 ♀ (USNM No. 180379) and paratypes 3 ♀♀, 4 ♂♂ (USNM No. 180380–180381).

Type-locality.—31°34'N, 80°03'W.

Etymology.—The Latin word *improvisus* means unexpected.

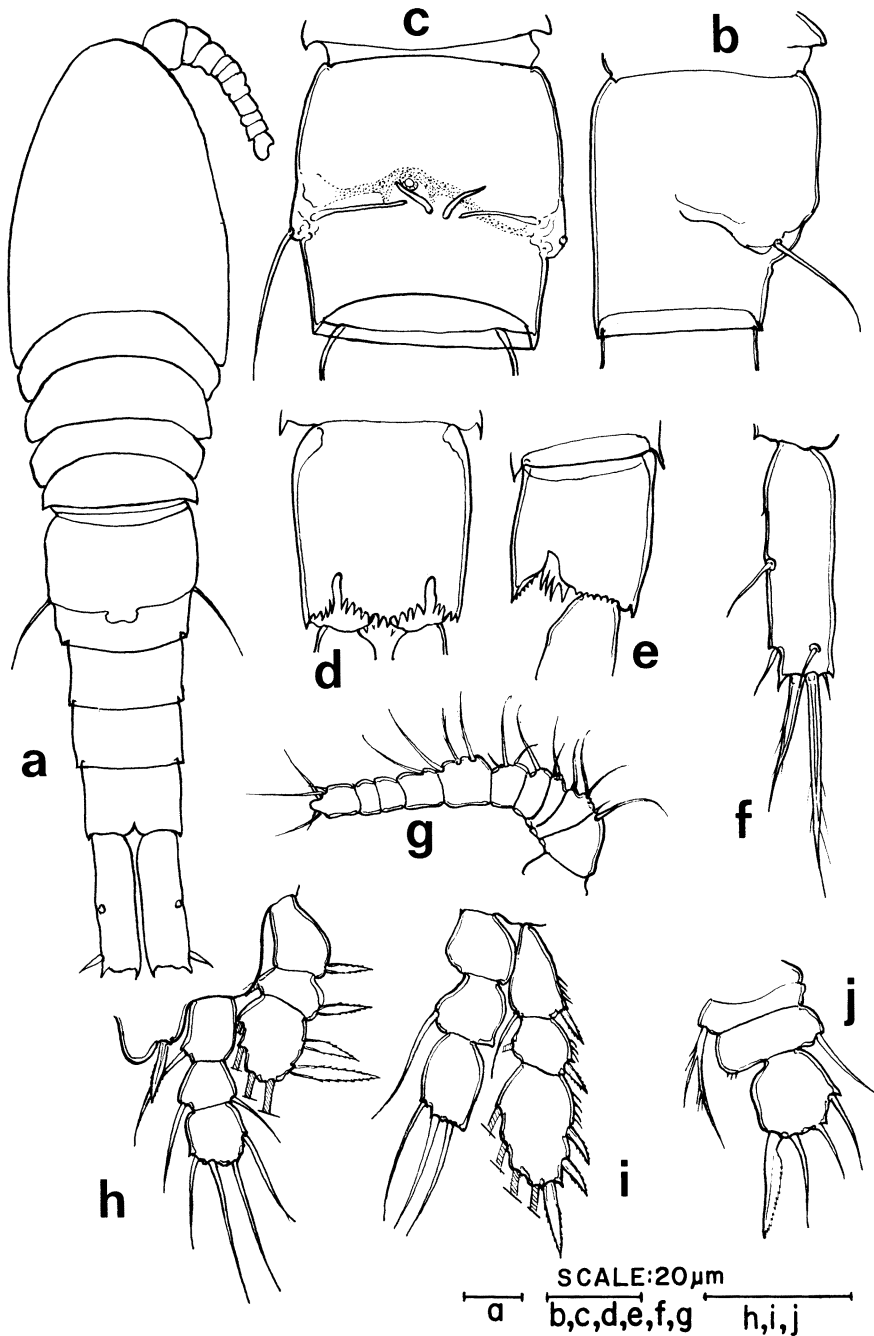


Fig. 2. *Metacyclopina improvisa*, new species. Female: a, dorsal; b, genital segment, lateral; c, genital segment, dorsal; d, anal segment, dorsal; e, anal segment, lateral; f, caudal ramus, dorsal; g, first antenna; h, leg 1; i, leg 4; j, leg 5.

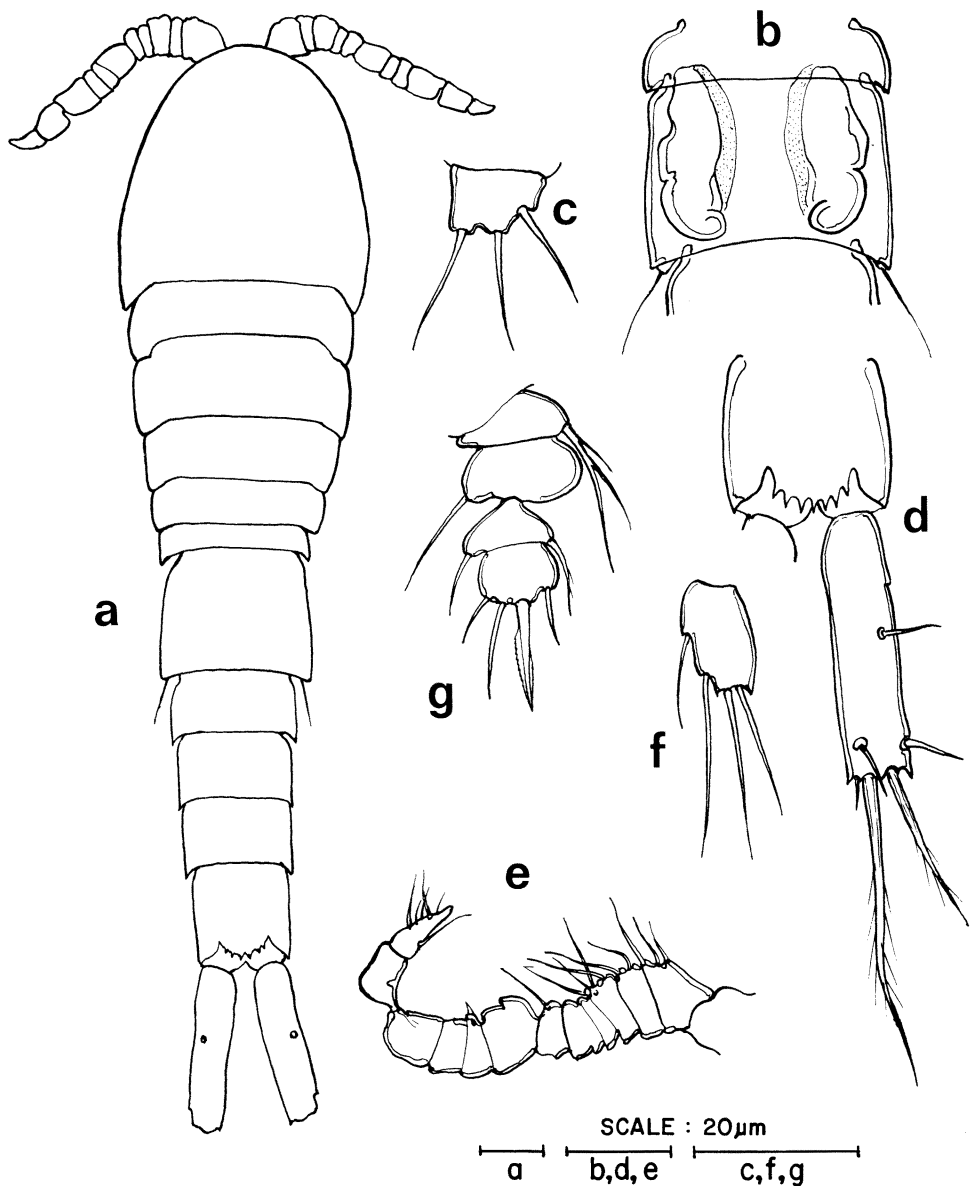


Fig. 3. *Metacyclops improvisa*, new species. Male: a, dorsal; b, genital segment, ventral; c, genital theca; d, anal segment and caudal ramus, dorsal; e, first antenna (drawn from another individual than that of Fig. 3a), dorsal; f, third segment of endopod of leg 4; g, leg 5.

Description.—The female has a slender body form similar to the other known species (Fig. 2a). The total length ranges from 0.351 to 0.385 mm. The cephalothorax is slightly shorter than the abdomen including the caudal ramus. The midcephalothoracic area is the widest and the genital segment is wider than the remaining abdominal segments. The genital spermathecal opening (Fig. 2b) is

Table 1. Measurements (in μm) of body parts of *Metacyclopina improvisa*, new species.

Body part	Female		Male	
	Length	Width	Length	Width
Cephalothorax	189	82	168	86
Abdomen	196	—	180	—
GENS	58	58	40	49
SEG2	28	40	—	—
SEG3	28	35	—	—
Anal SEG	31	34	—	—
CR	48	15	50	14
A1	74	—	—	—
P4 EN3	13	11	14	8
P5 SEG1	5	16	6	16
SEG2	8	16	8	14
SEG3	11	12	7	11
SEG4	—	—	6	11

located ventrolaterally near the middle of the genital segment and bears a long smooth seta extending beyond the posterior end of the segment. On the dorsal side of the genital segment there are two pairs of sclerotized ridges (Fig. 2c). Two ribbonlike fields extend from the ventral side of the genital segment to the genital spermatheca. The posterior margins of all abdominal segments are smooth, except for the anal segment where the posterolateral margins and border of the anal operculum are serrate (Fig. 2d, e). The caudal ramus is about 3.5 times as long as wide and has 2 lateral, 1 dorsal, and 3 terminal setae (Fig. 2f).

A1: 10 SEG (Fig. 2g).

A2 and the mouthparts: all similar to those of other species in the genus.

P1–4: both endopod and exopod are 3-segmented; the spine and setal formulas of EX3 are 2,3,3,3 and 4,4,4,4, respectively.

P1: B2 with an inner distal SPN (Fig. 2h).

P4: EN3 with 3 terminal SET (Fig. 2i).

P5: 3-segmented; SEG1 inner margin with a branched SET; SEG2 with a smooth SET; SEG3 with 3 terminal SET and 1 scalpel SPN (Fig. 2j).

The male is slightly more slender (Fig. 3a) and smaller than the female (total length, 0.348 mm). The genital segment is constricted at the spermatophore area (Fig. 3b) and the genital theca is extended outward with 3 terminal setae (Fig. 3c). The anal segment has serrate posterolateral margins similar to the female, but the anal operculum has fewer and smaller denticles than in that sex (Fig. 3d). The caudal ramus is 3.5 to 4 times as long as wide and has the same number of setae as the female, but the midlateral seta is positioned somewhat dorsally (Fig. 3d).

A1: 12-segmented (Fig. 3e).

P1–4: similar to those of female, except that EN3 inner margin with 2 SET (Fig. 3f).

P5: 4-segmented as in the other species (Fig. 3g); SEG1 inner margin with a branched SET; SEG2 with an outer SET; SEG3 with an inner and outer SET; SEG4 with 2 terminal SET, 1 scalpel SPN, and 1 inner subterminal SET.

Based on body appearance, mouthparts, and legs, particularly on P5, the species described here belongs to *Metacyclopina* Lindberg (1952). So far, three

Table 2. Comparison of the caudal ramus and fifth leg among the species of *Metacyclopsina*.

Species	Caudal ramus						P5 terminal SEG					
	CR LG	CR WD	SET*				CR LG	SET** LG	SEG LG	SET*		
			1st	2nd	3rd	4th				1st	2nd	3rd
<i>M. harpacticoidea</i>	3.37	1	1	2.64	4.07	0.57	1.00	1	1	1.00	1.92	1.31
<i>M. roscoffensis</i>	2.94	1	1	2.74	4.53	0.50	1.57	1	1	1.11	2.42	1.64
<i>M. brevisetosa</i>	3.00	1	1	2.00	2.15	0.62	1.71	1	1	1.08	2.00	1.50
<i>M. improvisa</i> , new species	3.20	1	1	2.42	3.50	0.58	1.14	1	1	0.91	1.45	1.45

* Setae counted from outer side.
 ** Longest terminal seta.

species have been described: *M. harpacticoidea* (Klie, 1949), *M. roscoffensis* (Bozic, 1953), and *M. brevisetosa* (Herbst, 1975). However, the individuals from the southeastern United States continental shelf could not be identified with any of these three known species. The character distinguishing the female of this new species from its congeners is the absence of the median SET on the inner margin of P4 EN3. In addition, the female has a different arrangement of SET and SPN on P5 SEG3. Other female characters such as the length of A1 and the length of CR terminal SET are different from those of *M. harpacticoidea* and *M. roscoffensis* respectively. The male has a different setal arrangement on P5, particularly from *M. harpacticoidea*. The length of SET on the genital theca is also different from *M. roscoffensis*. *M. brevisetosa* is clearly distinguished from this new species by the length of CR terminal SET, the location of CR lateral SET, and the number of marginal teeth on anal operculum.

Measurements of body parts of this new species are summarized in Table 1 and the comparisons of CR and P5 measurements among the species are shown in Table 2.

KEY TO THE SPECIES OF *METACYCLOPINA*

Female

- 1. P4 EN3 with 3 SET *M. improvisa*
- P4 EN3 with 4 SET 2
- 2(1). CR 2 median terminal SET LG 1:0.9 at least *M. brevisetosa*
- CR 2 median terminal SET LG 1:0.5 at most 3
- 3(2). CR LG equal to CR longest terminal SET *M. harpacticoidea*
- CR LG longer than CR longest terminal SET *M. roscoffensis*

Male

- 1. P5 SEG1-3 inner margins with 1,1,1 SET *M. harpacticoidea*
- P5 SEG1-3 inner margins with different setal formula 2
- 2(1). P5 SEG1-3 inner margins with 1,0,2 SET *M. roscoffensis*
- P5 SEG1-3 inner margins with formula otherwise 3
- 3(2). P5 SEG1-3 inner margins with 1,0,1 SET *M. improvisa*
- P5 SEG1-3 inner margins with 0,1,2 SET *M. brevisetosa*

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LITERATURE CITED

- Bozic, B. 1953. *Metacyclopina roscoffensis* n.sp. copépode cyclopoïde des sables de Roscoff.—Bulletin de la Société Zoologique de France 78: 403–408.
- Herbst, H.-V. 1974. Drei interstitielle Cyclopinae (Copepoda) von der Nordseeinsel Sylt. In: *Microfauna des Meeresbodens* 35: 1–17. Akademie der Wissenschaften und der Literatur, Mainz.
- Klie, W. 1949. Neues von den Copepoden Helgolands.—Abhandlungen herausgegeben vom naturwissenschaftlichen Verein zu Bremen 32(2): 256–265.
- Lindberg, K. 1952. La sous-famille des Cyclopininae Kiefer (Crustacées Copépodes).—Arkiv för Zoologi, ser. 2, 4(16): 311–325.

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