# CUMÁCEOS (CRUSTACEA: PERACARIDA) LITORALES DEL PACÍFICO SUR DE MÉXICO, CON CLAVES DE IDENTIFICACIÓN PARA LAS ESPECIES DEL PACÍFICO ORIENTAL TROPICAL

TESIS QUE PRESENTA **JANI JARQUÍN GONZÁLEZ**

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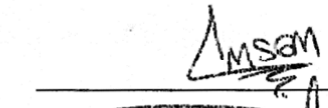
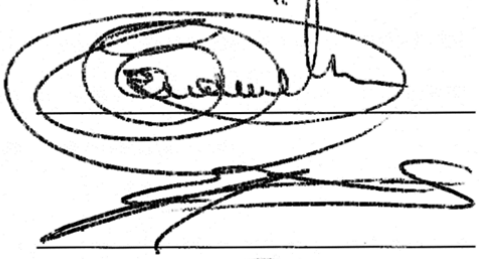
| Director | Dra. Socorro García Madrigal |  |
| Comité Tutorial | Dr. Michel E. Hendrickx |  |
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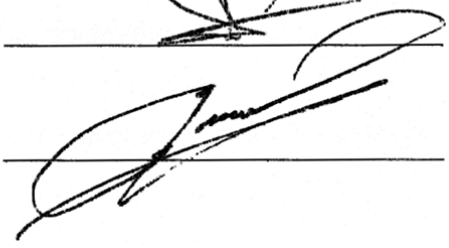
| Jurado | Dr. Miguel Ángel Morón Ríos |  |

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## DEDICATORIA

A mi familia, por su infinito amor y comprensión. Que no importa donde éste o que suceda, siempre están a mi lado apoyándome, aconsejándome y haciéndome sonreír. Sin ustedes no sería lo que soy. Los amo.

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## DECLARACIÓN

Excepto cuando es explícitamente indicado en el texto, el trabajo de investigación contenido en esta tesis fue efectuado por la Biól. Mar. Jani Jarquín González (MM10015) como estudiante de la carrera de Maestro en Ciencias entre Agosto de 2010 y Agosto del 2012, bajo la supervisión de la Dra. Socorro García Madrigal.

Las investigaciones reportadas en esta tesis no han sido utilizadas anteriormente para obtener otros grados académicos, ni serán utilizadas para tales fines en el futuro.

Candidato: Biól. Mar. Jani Jarquín González

Director de tesis: Dra. Socorro García Madrigal

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Los cumáceos desempeñan un papel ecológico fundamental en el ambiente marino debido a que son una fuente importante de alimento para vertebrados e invertebrados marinos; además son considerados como un excelente modelo para estudios distribucionales, ecológicos y de calidad ambiental en aguas costeras.

A pesar de su importancia, las tallas pequeñas (1.7 mm de longitud en promedio), carencia de literatura regional especializada, dificultad para recolectar organismos en determinados sitios y presencia de especies crípticas, incrementan el grado de complejidad para el reconocimiento de las especies.

En el Pacífico oriental se conocen más de 51 especies, de las cuales cuatro han sido descritas para la costa oeste de Baja California y golfo de California, mientras que para el Pacífico sur de México (PSM) no existen registros. Por ello el objetivo de este trabajo fue reconocer las especies, para incrementar la información taxonómica de los cumáceos del Pacífico oriental tropical (POT), Pacífico mexicano y Pacífico sur de México y generar la primera clave de identificación para las especies del Pacífico oriental tropical.

Se realizaron diversos muestreos en los litorales de los estados de Guerrero, Oaxaca y Chiapas; mediante la extracción de sedimentos duros (rocas de coral muerto) y blandos (esponjas, ascidias, algas) se obtuvieron los cumáceos, los cuales fueron disectados y posteriormente montados en laminillas semipermanentes de glicerol al 50% para su observación al microscopio.

De 378 ejamplares examinados, se reconocieron seis nuevas especies pertenecientes a tres familias y cinco géneros, *Cyclaspis* sp. nov. 1, *Cyclaspis* sp. nov. 2, *Coricuma* sp. nov., *Cumella* (*Cumewingia*) sp. nov., *Elassocumella* sp. nov., y *Schizotrema* sp. nov. Además para el género *Coricuma* Watling & Breedy, 1987 se amplía su ámbito de distribución de Costa Rica a México, y se describe la segunda especie del género. Se registran por primera vez en el Pacífico oriental los géneros *Elassocumella* Watling, 1991 conocido sólo para el golfo de México y *Schizotrema* Calman, 1911 presente únicamente en el Indo-Pacífico y Atlántico. Todas las especies encontradas en el PSM son nuevas para la ciencia.

# INTRODUCCIÓN GENERAL

El orden Cumacea comprende un grupo de pequeños crustáceos pertenecientes al superorden Peracarida y a la subclase Malacostraca. Actualmente existen aproximadamente 1,593 especies divididas en ocho familias y 138 géneros reconocidos (Anderson 2010).

Los cumáceos son bénticos y viven principalmente semienterrados en las capas superficiales de sedimento fino y rico en detritus, así como en sustratos arenosos, coralinos y rocosos con organismos incrustantes (*e.g.* algas, esponjas, hidroides, briozoarios) (Heard *et al*. 2007); no obstante también suelen aparecer en muestreos planctónicos ya que se ha documentado que realizan migraciones verticales para propiciar su apareamiento o la muda del exoesqueleto (Roccatagliata 2004). Además de acuerdo a Bacescu & Petrescu (1999), aunque los cumáceos son fundamentalmente marinos (90%) también pueden encontrarse en ambientes salobres (6%) y dulceacuícolas (2%), así como distribuirse desde la zona intermareal hasta 8, 100 m de profundidad.

Al igual que otros grupos de peracáridos (*e.g.* tanaidáceos), los cumáceos desempeñan un papel fundamental en las cadenas tróficas marinas por lo menos del Mar Mediterráneo , ya que están considerados como uno de los principales componentes en las dietas de peces juveniles, decápodos y estrellas de mar. Además de acuerdo a Bacescu & Petrescu (1999) debido a su abundancia dentro de las comunidades bénticas (más de 1,000 ind/$m^2$), su carencia de estadios larvales pelágicos (desarrollo epimórfico), presentar sensibilidad al contenido de materia orgánica y/o granulometría del sedimento (Corbera & Cardell 1995) y utilizarse como bioindicadores, los cumáceos están considerados como un excelente modelo para los estudios distribucionales, ecológicos y de calidad ambiental de las aguas costeras (Sánchez-Moyano & García-Gómez 1998).

Con respecto a su morfología, los cumáceos se caracterizan por medir de 1 a 35 mm de longitud; tener un prominente cefalotórax, originado de la fusión de un caparazón con los primeros tres segmentos torácicos (en casos particulares se pueden unir con el cuarto, quinto o sexto segmento), formando una cavidad branquial con placas laterales que se extienden desde la parte central hacia la parte anterior del caparazón, formando un pseudo-rostro; los ojos están generalmente fusionados y localizados en la zona anterior del cefalotórax; mandíbulas sin palpo; primeros tres pares de pereópodos modificados como maxilípedos, el primero presenta un elaborado epipodito branquial y un exópodo o sifón que se extiende por debajo del pseudo-rostro, mientras que el segundo maxilípedo exhibe una coxa fusionada de la cual emergen endópodos alargados; cinco pereonitos con cinco pares de pereópodos (los pereópodos 2-4 pueden presentar pequeños exópodos unirrámeos y multiarticulados); seis

pleonitos que pueden presentar 0-5 pares de pleópodos; un telson que puede o no estar fusionado con el sexto pleonito; y un par de urópodos (Figura 1 y 2) (Schram 1986, Watling 2007, Heard *et al.* 2007).

En los cumáceos el dimorfismo sexual es común; las hembras generalmente son de mayor tamaño que los machos; además las hembras se caracterizan por presentar un "saco" o marsupio y carecer de pleópodos (a excepción del género *Archeocuma*), a diferencia de los machos que si los presentan. Por otra parte, Heard *et al.* (2007) indican que algunos de los caracteres de mayor valor taxonómico para la identificación a nivel de familia son la morfología de las piezas bucales, el desarrollo de los maxilípedos, el número de exópodos en hembras y machos, la presencia o ausencia del telson, y el número o ausencia de pleópodos en machos. Mientras que para nivel de género y especie están la ornamentación (o carencia de ella) en el caparazón; forma y estructura del pseudo-rostro, lóbulo ocular, maxila 2, maxilípedos 1-3, pereópodos 1-2; la longitud de los pleonitos 5-6, y la morfología de los urópodos (*e.g.* número de segmentos, ornamentación).

Históricamente a pesar de ser un grupo claramente reconocible, la escasez de estudios taxonómicos y sistemáticos ocasionó que una de las tareas más difíciles en la identificación de una especie, fuera su determinación a nivel de familia. Lo anterior se fundamenta en las investigaciones de diversos autores (Stebbing 1913, Zimmer 1941) quienes no pudieron establecer un acuerdo respecto al número de familias (de 4 a 26) dentro del orden, debido a que los caracteres de mayor valor morfológico (*e.g.* forma del telson, número de exópodos en los pereópodos y/o número de pleópodos) variaban dentro de los miembros de un mismo género (Gerken 2001). Actualmente, acorde a Heard *et al.* (2007), la mayoría de los investigadores dedicados al estudio de los cumáceos reconocen ocho familias con base al documento de Bacescu & Petrescu (1999).

De manera general y de acuerdo a Shram (1986) dentro de los trabajos prominentes en taxonomía de cumáceos están Sars (1900) particularmente por su monografía sobre cumáceos de Noruega; Lomakina (1958) por su estudio sobre los cumáceos de la Unión Soviética (U.R.S.S.); Jones (1969) por los cumáceos obtenidos en la expedición "Galathea II"; así como Stebbing (1913) quien presenta las modificaciones taxonómicas del grupo a través del tiempo. Asimismo otra referencia importante incluye a Bacescu (1988, 1992) que hace una compilación sobre los cumáceos de aquel entonces.

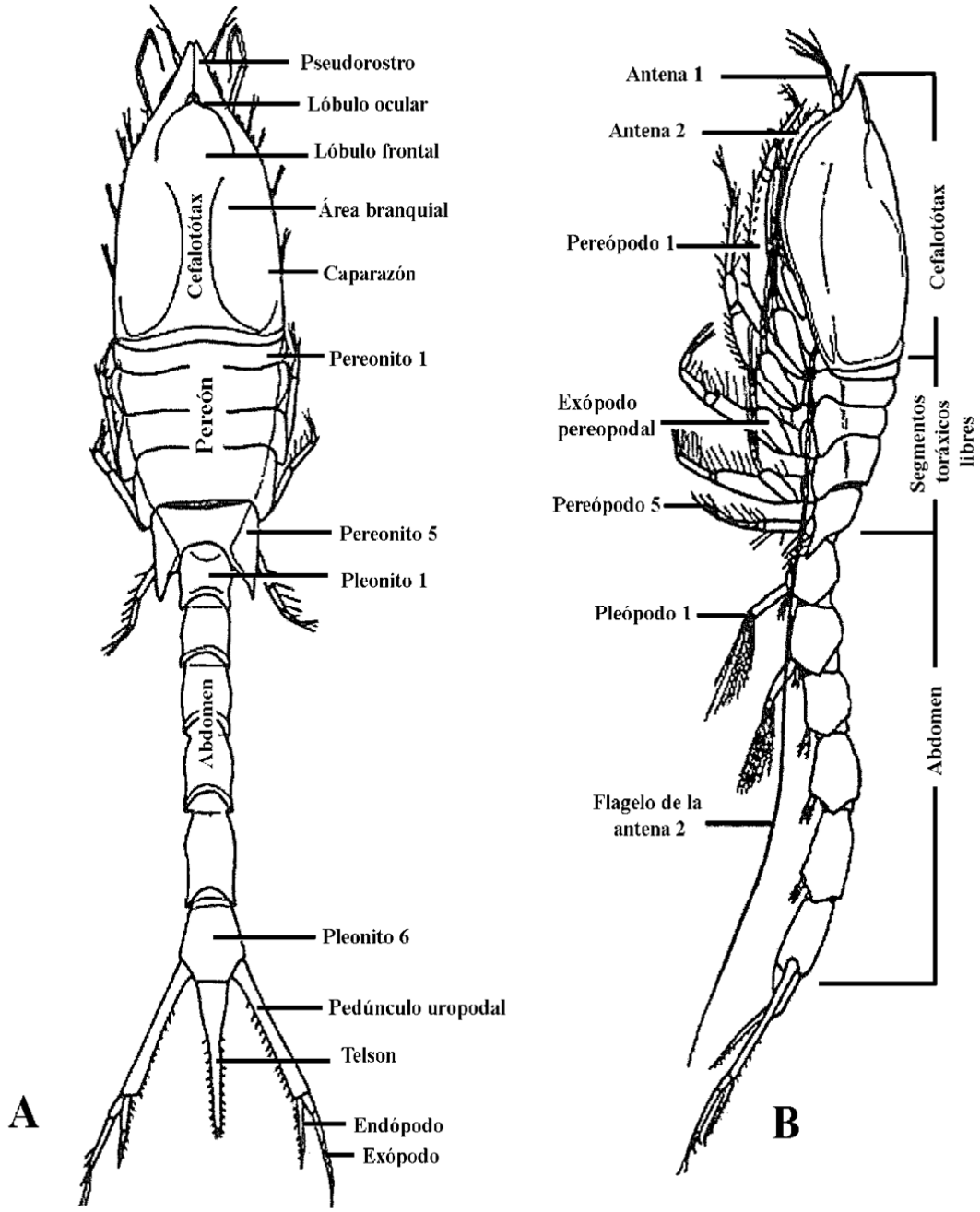


**Figura 1.** Morfología general de un cumáceo; A) vista dorsal y B) lateral, (modificado de Heard *et al*. 2007).

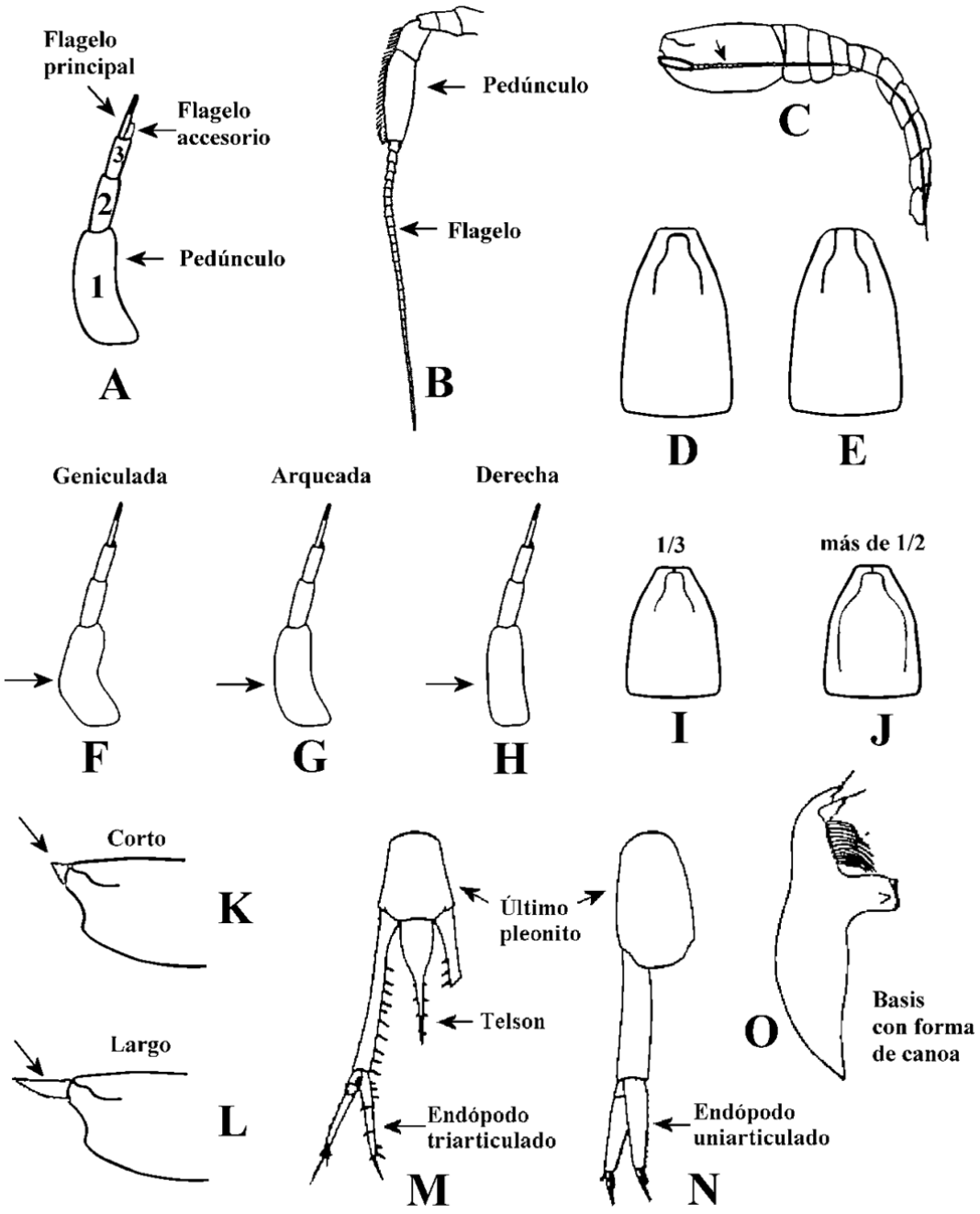


**Figura 2**. Morfología general de algunos apéndices en cumáceos, A) Antena 1 de hembras; B) antena 2 de machos; C) longitud de la antena 2 respecto al cuerpo; D) márgenes del caparazón sobrepasan los lóbulos frontales; E) márgenes del caparazón no sobrepasan los lóbulos frontales; F) antena 1 con basis geniculada (con forma de rodilla); G) antena 1 con basis arqueada; H) antena 1 con basis derecha); I-J) proporción lóbulos frontales respecto a la longitud del caparazón; K-L) longitud del sifón; M) cumáceo con telson (*e.g.* Diastylidae y Leuconidae); N) cumáceo sin telson (*e.g.* Bodotriidae y Nannastacidae); O) mandíbula. Figs. 4A-L mofidicadas de Haye (2007) y figs. 4M-O modificadas de Heard *et al.* 2007.

Otros estudios enfocados a la sistemática del grupo incluyen a Watling (1991a-b) quien hace una revisión de la familia Leuconidae y de algunos géneros de la familia Nannastacidae; a Gerken (2001) quien igualmente realiza una revisión para la familia Gynodiastylidae; así como Haye (2007) quien proporciona una revisión de la familia Bodotriidae.

Por otra parte para el golfo de México y mar Caribe de México algunas de las contribuciones taxonómicas más importantes son Radhadevi & Kurian (1981) quienes dieron a conocer un nuevo género y tres nuevas especies, así como Donath-Hernández (1988a) quien realizó la descripción de especies y proporcionó nuevos registros y ampliaciones de distribución; por su parte Heard & Roccatagliata (2009) realizaron una compilación sobre las especies descritas en el área. Además, dada su cercanía con esta área algunos trabajos que resultan importantes son Bacescu (1971), Watling (1979), Omhold & Heard (1982) y Heard *et al*. (2007).

Con respecto al Pacífico oriental (PO), California (EUA) es una de las localidades más sobresalientes con respecto a estudios taxonómicos para cumáceos. Algunos de los trabajos incluyen a Calman (1912) que hizo la revisión de los cumáceos presentes en la Colección de Nacional de los Estados Unidos; Barnard & Given (1960) quienes dan a conocer la morfología y ecología de dos especies; por su parte Gladfelter (1975) describió cinco nuevas especies; mientras que Watling & McCann (1997) dan a conocer un atlas taxonómico para la fauna béntica de Santa Maria Basin y el canal de Santa Bárbara.

Otras localidades que han sido estudiadas dentro del PO se encuentran ubicadas en el Pacífico oriental tropical, definida como el área entre bahía Magdalena, México a Paita, Perú (Espinosa-Pérez & Hendrickx, 2006). De acuerdo a Brusca & Wallerstein (1979) esta subregión incluye por lo menos cuatro provincias zoogeográficas (provincia de Cortés, provincia Mexicana, provincia Panámica y la provincia de Galápagos), donde se han reconocido 24 especies, de las cuales 17 son litorales y siete de mar profundo. Con base en lo anterior se sabe que Zimmer (1943, 1944) describió dos nuevas especies de la provincia Panámica y registró una especie más para la provincia de Galápagos; Jones (1944, 1969) identificó dos especies para la provincia Panámica; mientras tanto Bacescu (1961, 1962) reconoció tres especies para esta misma provincia y una especie más para la provincia de Galápagos; Bacescu-Mester (1967) describió una especie para la provincia Panámica, mientras que Donath-Hernández (1987a, 1988b, 2011) describió cuatro especies nuevas y registró cinco especies más para la provincia Cortés; así mismo Watling & Breedy (1988), Petrescu & Heard (2004) y Petrescu *et al*. (2009) caracterizaron un nuevo género,

describieron tres nuevas especies y registraron siete especies más, respectivamente para la provincia Panámica. Para la provincia Mexicana no hay un sólo registro.

La necesidad de realizar estudios taxonómicos se justifica porque son la base para el desarrollo de cualquier tipo de estudio biológico y ecológico, y además porque mediante ellos se puede influir en la formulación de criterios de bioconservación (*e.g.* determinación de especies indicadoras o exóticas, actividades de monitoreo, selección de áreas y/o especies prioritarias de conservación) y en la elaboración de inventarios biológicos que sirvan como punto de partida para realizar estudios sobre la estructura de las cadenas tróficas, la abundancia relativa de las especies, las variaciones morfológicas entre los organismos, los patrones de distribución, etc. (May 1992, Salazar-Vallejo *et al*. 2008).

Como se ha mencionado, los cumáceos desempeñan un papel ecológico primordial en el ambiente costero; no obstante, los problemas relacionados con su taxonomía (*e.g.* dificultad en la identificación de especies, información especializada dispersa y frecuentemente poco accesible) y sus características biológicas (*e.g.* especies crípticas, tamaño pequeño), obstaculizan el avance en el conocimiento del grupo.

Lo anterior, es un conjunto de factores que motivan a la realización de esta investigación cuya finalidad es dar a conocer la composición específica de los cumáceos del Pacífico sur de México, sus patrones generales de distribución geográfica, así como elaborar una clave dicotómica, ilustrada y reversible para las especies litorales del POT. Todo esto con el propósito de brindar las bases necesarias para impulsar la realización de futuros estudios que permitan mejorar el conocimiento biológico y taxonómico de los cumáceos, para así, comprender plenamente su papel dentro de la dinámica ecológica del bentos marino.

## OBJETIVO

Incrementar la información taxonómica de los cumáceos del Pacífico sur de México y generar claves de identificación para las especies presentes en el Pacífico oriental tropical.

## MATERIAL Y MÉTODOS

### Área de estudio

El área de estudio se localiza entre el litoral de la costa suroccidental del Pacífico mexicano (Guerrero: 16º19’N, 102º11’O), la costa del golfo de Tehuantepec y la costa de Chiapas (14º32’, 94º14’O) (Figura 3).

El litoral de Guerrero y Oaxaca, presenta costas rocosas que generalmente se alternan con playas bajas arenosas; a partir de los 15º39’N, 96º31’O, la planicie costera se amplía

gradualmente conforme se dirige hacia el oriente, en el istmo de Tehuantepe (Carranza-Edwards *et al*. 1998). Por su parte, la costa chiapaneca está conformada por extensas playas de arena, la mayoría de textura gruesa y media (Ortiz-Pérez & de la Lanza-Espino 2006).

En el área de estudio impera un clima cálido (Aw) y cálido húmedo con abundantes lluvias en el verano (Am), con una temperatura ambiente media anual de 27ºC (García 1981). En primavera, la temperatura superficial del agua es alta (> 25ºC) y la salinidad menor (34‰), mientras que en otoño la temperatura disminuye (15-28ºC) y la salinidad aumenta (35.00 a 36‰), lo anterior debido a la irrupción tanto de la corriente de California como de la corriente costera de Costa Rica (Monreal-Gómez & Salas de León 1998).

La zona presenta principalmente dos períodos climáticos: a) secas, con predominio de vientos del norte, con duración de siete meses aproximadamente, de noviembre hasta mayo; y b) lluvias, con predominio de tormentas tropicales, entre los meses de junio a octubre. Durante el invierno (enero-marzo), como resultado de perturbaciones atmosféricas provenientes del golfo de México, azotan fuertes vientos del norte, denominados Tehuanos, sobre el golfo de Tehuantepec, los cuales generan un evento estacional de surgencias que propicia un incremento en el aporte de nutrientes hacia la superficie del mar (Monreal-Gómez *et al.* 1999).

**Campo**

El material biológico analizado provino tanto de ejemplares recolectados en campo como de material depositado en la Colección Científica del Laboratorio de Sistemática de Invertebrados Marinos (OAX-CC-249-11), en la Universidad del Mar campus Puerto Ángel, Oaxaca.

El material proveniente del campo se obtuvo mediante el método propuesto por García-Madrigal (2003), el cual consiste en la recolección de ejemplares por buceo libre y el uso de nucleadores para extracción de sedimento. Como los cumáceos se pueden localizar en varios sustratos (rocosos, coralinos, sedimentos finos, algas, etc.), el procesamiento de las muestras varió dependiendo del sustrato recolectado. Cuando se obtuvo sustrato duro (rocas o coral), las muestras se procesaron *in situ*, es decir, se realizó la fragmentación directa del material en el campo y se separó la macrofauna a grandes grupos (poliquetos, moluscos, macrocrustáceos y otros invertebrados).

Con respecto al sustrato fino (sedimentos) éste se colocó dentro de un frasco para su posterior análisis en el laboratorio. Tanto el material obtenido de la fragmentación de fondos duros, como de los restos del material de fondos blandos, se tamizaron *in situ* utilizando agua

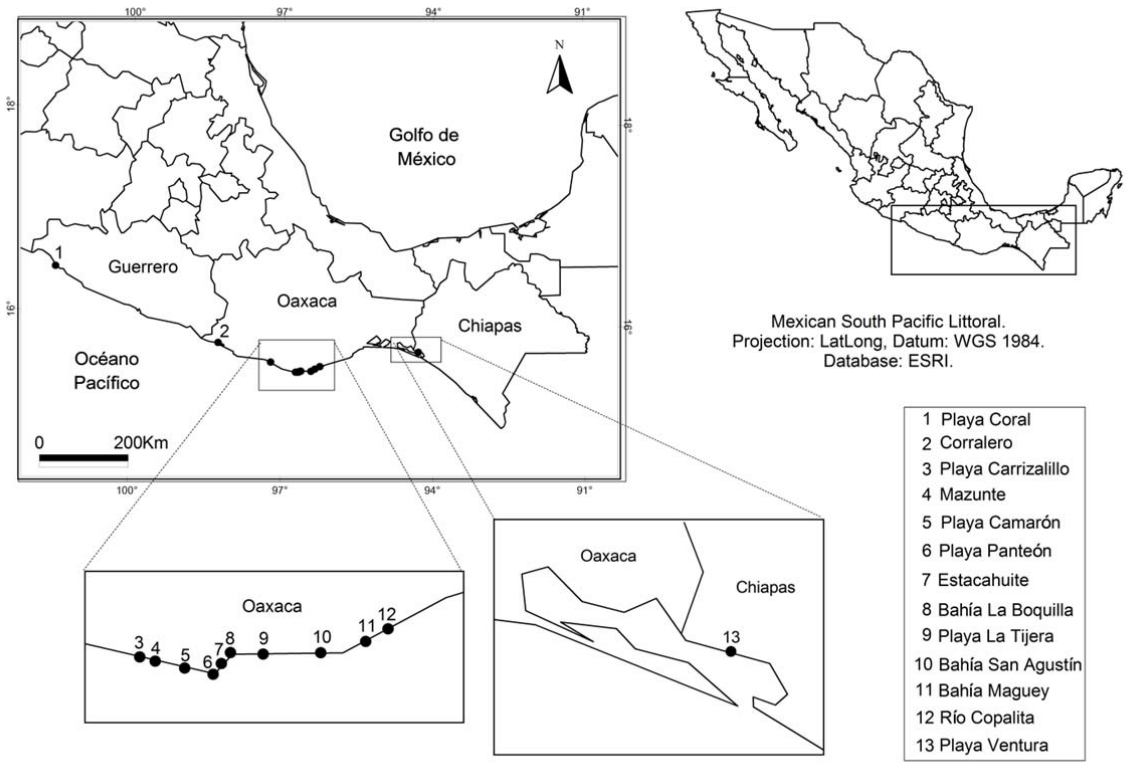


**Figura 3.** Mapa de las localidades muestreadas a lo largo del Pacífico sur de México.

de mar con dos tamices de 0.5 y 1.0 mm de luz de malla o con agua dulce en el laboratorio. Una vez obtenido el tamizado se fijó con formol al 4% para su posterior separación.

**Laboratorio**

En el laboratorio se procesaron las muestras para su preservación, para ello fue necesario vaciar el material en un tamiz de 0.5 mm para lavar el exceso de formol, así se evitó que los peracáridos, y en particular los cumáceos, se pierdan junto con el líquido. Las muestras se dejaron reposar por 24 horas en agua dulce para eliminar el exceso de formol; a continuación se preservaron en alcohol al 70% y con algunas gotas de glicerina, para proporciona mayor elasticidad a las articulaciones. El material se examinó bajo un microscopio estereoscópico y los cumáceos encontrados se separaron por morfotipos, para posteriormente identificar las especies.

Para realizar las observaciones de los ejemplares fue necesario montarlos en preparaciones semipermanentes, debiéndose colocar al organismo en un portaobjetos con glicerol al 50%; posteriormente, con la ayuda de pinzas y agujas finas para microdisección se dispuso al organismo en posición ventral y se removieron las estructuras del lado derecho

(*e.g.* antena 1, antena 2, mandíbulas, maxilípedo 3, pereópodos 1-5, telson, urópodos) para llevar a cabo la identificación. Dichas estructuras se depositaron en otro portaobjetos (el cual contuvo una pequeña gota de glicerol al 50%), y se cubrió con un cubreobjetos más pequeño; a continuación se sellaron con barniz transparente de uñas y finalmente se etiquetaron con la siguiente información: nombre de la especie, sexo, localidad, fecha, sustrato, recolectores, iniciales de quien determinó la especie, medio y fecha de montaje. Para las estructuras de importancia taxonómica se realizaron dibujos con la ayuda de una cámara clara. También se tomarón fotografías digitales de los ejemplares completos y de sus principales apéndices con ayuda de un estéreo-microscopio y de un microscopio compuesto.

La identificación se efectuó con ayuda de la literatura mencionada en los antecedentes así como por las claves de Watling & McCann (1997), Haye (2007) y Heard *et al*. (2007). Asimismo, éstas claves se utilizaron como base para preparar una clave ilustrada, dicotómica y reversible. Todo el material analizado se depositó y catalogó en la Colección Científica, sección Peracarida, del Laboratorio de Sistemática de Invertebrados Marinos en la Universidad del Mar (UMAR-PERA).

**Tratamiento taxonómico**

El tratamiento taxonómico incluyó los siguientes apartados: nombre de la especie y autoría, número de figura, sinonimias, localidad y número de catálogo del material tipo, distribución geográfica, localidad de recolecta, fecha, sustrato y profundidad recolectores), comentarios taxonómicos, y observaciones generales. El arreglo sistemático a familia se basó en la clasificación de Martin & Davis (2001) y para géneros y especies se organizó en orden alfabético.

## LITERATURA CITADA


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# CAPÍTULO 1:

# Littoral cumaceans (Crustacea: Peracarida) from the Mexican South Pacific, with keys to the Tropical Eastern Pacific species

# Littoral cumaceans (Crustacea: Peracarida) from the Mexican South Pacific, with keys to the Tropical Eastern Pacific species

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## Abstract

The cumaceans have a fundamental ecological role in the marine environment because they are a source of food for some marine invertebrates and vertebrates; also, they're also considered a model for distributional and ecological studies and for environmental quality assessments of coastal waters. However, their small sizes (1.7 mm length), dimorphism related with the sex, cryptic species and lack of regional specialized literature increase the complexity for the recognition of species; foregoing is reflected particularly in the Mexican South Pacific, a region that lack previous records to this work. The examination of 378 specimens resulted in six new species, belonging to three families and five genera, *Cyclaspis* sp. nov. 1, *Cyclaspis* sp. nov. 2, *Coricuma* sp. nov., *Cumella* (*Cumewingia*) sp. nov., *Elassocumella* sp. nov., and *Schizotrema* sp. nov. The genus *Coricuma* Watling & Breedy 1987, is increased their geographical range, from Costa Rica to México, and is described the second species of this genus, before monoespecific. Are recorded for the first time to the Eastern Pacific the genera *Elassocumella* Watling, 1991 and *Schizotrema* Calman, 1911. An identification key to all species of cumaceans recognized from the Tropical Eastern Pacific is included.

**Keywords: Cumacea, new species, peracarids, shallow water, Tropical Eastern Pacific.**

## Resumen

Los cumáceos desempeñan un papel ecológico fundamental en el ambiente marino ya que son fuente de alimento para algunas especies de vertebrados e invertebrados marinos, y porque son considerados un modelo para estudios distribucionales, ecológicos y de calidad ambiental en aguas costeras. Sin embargo, las tallas pequeñas (1.7 mm de longitud en promedio), la dificultad para recolectar organismos en determinados tipos de área y especies crípticas, así como la carencia de literatura regional especializada, incrementan el grado de complejidad para el reconocimiento de las especies; lo anterior se refleja particularmente en el Pacífico sur de México, donde no existía ninguna especies conocida previo a este trabajo. Se examinaron 378 ejamplares resultando en seis nuevas especies, pertenecientes a tres familias y cinco géneros, *Cyclaspis* sp. nov. 1, *Cyclaspis* sp. nov. 2, *Coricuma* sp. nov., *Cumella* (*Cumewingia*) sp. nov., *Elassocumella* sp. nov. y *Schizotrema* sp. nov. Para el género *Coricuma* Watling & Breedy, 1987, se incrementó el ambito geográfico, desde Costa Rica hasta México, y se describe la segunda especie de este género, antes monoespecífico. Por primer vez se registran en el Pacífico oriental los géneros *Elassocumella* Watling, 1991 y *Schizotrema* Calman,

1911. Se incluye una clave de identificación para todas las especies de cumáceos registrados en el Pacífico oriental tropical.

## Introduction

The order Cumacea comprises a group of small crustaceans belonging to the superorder Peracarida and the subclass Malacostraca. Today there are more than 1 593 species described, divided into eight families and 138 genera recognized (Anderson 2010). This small crustaceans are benthic and live mostly half-buried in the surface layers of fine sediment, detritus, sandy substrates, rocky reefs and fouling organisms (e.g. algae, sponges, hydroids and bryozoans) (Heard *et al*. 2007). Furthermore, according to Bacescu & Petrescu (1999), the cumaceans are primarily marine (90%), also are found in brackish environments (6%) and freshwater (2%); the depth distribution is from the intertidal zone to 8 100 m. Cumaceans play an important role in marine food chains (due to its abundance in benthic communities, more than 1 000 ind/$m^2$), considered main food source for juvenile fish, decapods and starfish. Also, the lack of pelagic larval stages (epimorphic development), sensitivity to organic matter content and/or sediment grain size (Corbera & Cardell 1995, Sánchez-Moyano & García-Gómez 1998), they're considered an excellent model for distributional and ecological studies, as well as environmental quality assessments of coastal waters.

The cumaceans in the Tropical Eastern Pacific (TEP) are poorly known, some regions are quite scarce and are confined a few published reports and other areas there are currently no records. Among the authors who have described and/or recorded cumaceans from the TEP are: Zimmer (1943a, 1944), Jones (1944, 1969), Bacescu (1961, 1962), Bacescu-Mester (1967), Watling & Breedy (1988), Petrescu & Heard (2004) and Petrescu et al. (2009). For the Mexican Pacific, Donath-Hernández (1987a, 1988, 2011) described four species and recorded five more from the Gulf of California. therefore, in the TEP 24 species are recognized which 17 are littoral and seven from deep sea (Table 1).

In the Mexican South Pacific there are currently no records about cumaceans; and only there are two papers about peracarids, García-Madrigal (2010) with amphipods and Jarquín-González & García-Madrigal (2010) for tanaidaceans. The aim of this study is to increase the taxonomic information about peracarids, especifically cumaceans from the Mexican South Pacific and generate identification keys for Tropical Eastern Pacific species.

## Material and methods

The material collected was obtained from the coast of Mexican South Pacific (Guerrero, Oaxaca y Chiapas). The collection locality from Guerrero is: Coral beah, Ixtapa island, (17°40’35.727’’N, 101°39’27.8526’’W); from Oaxaca, Corralero lagoon, Pinotepa Nacional (16°14’11.2668’’N, 98°11’22.7544’’W), Carrizalillo beach, Puerto Escondido (15°51’28.818’’N, 97°4’48.3564’’W), Mazunte, Tonameca (15°39’45.1404’’N, 96°33’11.5734’’W), Camarón beach, Zipolite

(15°39’44.8236’’N, 96°31’33.2616’’W), Panteón beach, Puerto Ángel (15°39’50.5182’’N, 96°29'41.7906’’W), Estacahuite beach, Puerto Ángel (96°29’41.7906’’N, 96°28’ 53.2806’’W), La Boquilla bay, Puerto Ángel (15°40’55.743’’N, 96°27’54.0576’’W), La Tijera beach, Pochutla (15°41’11.2488’’N, 96°26’37.9206’’W), San Agustín bay, Huatulco (15°41’12.1482’’N, 96°13’58.929’’W), Maguey bay, Huatulco (15°43’54.9258’’N, 96°9’1.4682’’W), Copalita mouth river, Huatulco (15°46’57.4284’’N, 96°2’44.5668’’W). The only locality from Chiapas was: Ventura beach, Arriaga (16°5’41.7984’’N, 93°58’51.8982’’W) (Fig. 1).

The biological material was extracted from littoral zones, between algae, anemones, coral rock, mud and sand substrates, not exceeding 10 m of depth. The cumaceans were collected and fixed in a 4% formalin solution and transferred to 70% ethanol for preservation. The material was examined under a stereoscopic microscope and separated by morphotypes, and posteriorly identified to species. The specimens were measured from the length of the base carapace to the base of the telson (total length). Observations, dissections and mounted of the appendages were made 70% ethanol with glycerin and sealed with Entellan®. For some taxonomic structures were utilized a camera lucida and/or digital photos in order to draw the animal contour, later were used a stereo-microscope and a compound microscope for details. The identification was conducted with support the literature specialized, as well as the identification keys from Watling & McCann (1997), Haye (2007) and Heard *et al.* (2007). Also, these keys were used for preparing an illustrated, dichotomous and reversible key. All material analyzed was deposited in the Peracarid Section (UMAR–PERA) of the Colección Científica de Invertebrados Marinos, Universidad del Mar, Puerto Ángel, Oaxaca

## Results

Of 378 specimens analyzed, were identified six new species, of five genera and three families: Bodotriidae Scott, 1901 (one genus), Leuconidae Sars, 1878, (one genus), and Nannastacidae Bate, 1866 (three genera).

## Taxonomy

### Family Bodotriidae Scott, 1901

### Subfamily Bodotriinae G.O. Sars, 1878

### Genus *Cyclaspis* G.O. Sars, 1865

### *Cyclaspis* sp. nov. 1

(Figs. 2-5)

**Material examined**. Holotype ovigerous female (UMAR-PERA-488), Copalita mouth river, Huatulco, Oaxaca, dredging, 10 m depth, sandy sediment, 7 May 2007. Paratypes; 2 adult males (one

dissected), 1 ovigerous female (dissected), 3 adult females, 1 juvenile (UMAR-PERA-489), same locality and date.

**Diagnosis.** Body transparent and elastic. Antenna 1 with uniarticulated flagellum. Expansion of basis of maxilliped 3 with some setulae outer margin. Basis of pereopod 1 with one row of setulated setae on outer margin. Endopod of uropod with terminal seta fused.

**Description**. Adult male, 2.1 mm (Figs. 2 A-B). Body with translucent color; integument finely setose. Carapace oviform, two times longer than wide and longer than pereon, with surface smooth; frontal lobe representing approximately 1/3 the length of carapace; ocular lobe with three lenses and pigments; ocular lobe extend beyond to pseudorostral lobe; siphons slightly exceeding the pseudorostral lobes; antennal notch like depression. Pereon with five segments, the first segment visible only in lateral view; second, third and fourth segment with a pair of small plumose setae on each dorso-medial margin; fifth segment with one pair of small plumose setae on each dorso-distal margin. Abdomen partially lost, include only the first three segments with their respective pairs of pleopods. Pleotelson and uropods lost.

Antenna 1 (Fig. 2C) with first article of peduncle longer than the next two articles together; second article three times the length of the first article; main flagellum biarticulated, with basal article longer than distal article; with accessory flagellum small and uniarticulated. Antenna 2 (Fig. 2D) with four articles, article fourth is the longer than all; flagellum with short articles. Maxillule (Fig. 2E) with 11 spines on outer endite and five spines on inner endite. Maxilla (Fig. 3C) with setulae and 17 setae on inner margin of broad endite; with eight setae on distal narrow endite. Maxilliped 2 (Fig. 3B) basis with the same length than next articles together, with two plumose setae on dorsal surface; ischium short, bare; merus shorter than propodus; dactylus ½ the length of propodus, apical seta not fused. Maxilliped 3 (Fig. 3A) basis slightly arcuate, longer than the next articles together, with a row of setulae on inner margin, expansion of basis with six plumose setae in total; ischium short; merus with hyaline lamellae; carpus slightly longer than propodus; dactylus lost.

Pereopod 1 (Fig. 2F) basis longer than the next articles together, with four spines and 16 plumose setae on outer margin; ischium short; merus and carpus with the same length; dactylus longer than wide, with six setae in total; exopod with distal article shorter than basal article. Pereopod 2 (Fig. 3D) basis shorter than the next articles together, with six plumo-annulated setae; ischium three plumo-annulated setae; propodus longer than dactylus; dactylus with thick tip. Pereopod 3 (Fig. 3E) basis with three plumo-annulated setae in total. Pereopod 4 (Fig. 3F) with basis shorter than the next articles together, with four plumo-annulated setae in total; ischium short; merus slightly shorter than carpus; propodus shorter than dactylus; dactylus pointed. Pereopod 5 (Fig. 3G) with short ischium; merus longer than carpus; propodus shorter than dactylus, with one annulated seta; dactylus pointed. Pleopod 2 (Fig. 2G) peduncle longer than ramous; peduncle with five plumose setae on inner margin; with endopod biarticulated.

Ovigerous female, 2.5 mm (Figs. 4A-B). The overall appearance is similar to adult male. Frontal lobe representing approximately 1/4 the length of carapace; ocular lobes without lenses, only with pigments. Pleon shorter than carapace and pereon together.

Antenna 1 (Fig. 4C) with main flagellum uniarticulated and accessory flagellum reduced. Maxilliped 2 (Fig. 5A) basis with many setulae distally on dorsal surface; palp with seven annulated setae. Maxilliped 3 (Fig. 4D) basis geniculated, with serrated hyaline lamella on inner margin; expansion of basis with five plumose setae in total; merus without brush of setulae; dactylus longer than wide, with six setae in total.

Pereopod 1 (Fig. 4E) basis with bare outer margin; merus longer than carpus; exopod with distal article longer than basal article. Pereopod 2 (Fig. 5B) basis with three plumo-annulated setae; ischium with one plumo-annulated seta; propodus shorter than dactylus; dactylus with six setae, one of them annulated. Pereopod 3 (Fig. 5C) basis with five plumo-annulated setae in total. Pereopod 4 (Fig. 5D) basis with eight plumo-annulated setae in total. Pereopod 5 (Fig. 5E) similar to male.

Uropod (Fig. 5F-H) with peduncle longer than ramous, with some setulae on dorsal surface; exopod and endopod with the same length; endopod uniarticulated, with two pinnate spines on inner margin and three apical spines; exopod biarticulated, basal article shorter than distal article, with two distal spines; terminal seta fused.

**Distribution**. Copalita mouth river, Huatulco, Oaxaca; only know for type locality.

**Remarks**. According to Donath-Hernández (2011) nine species of the genus *Cyclaspis* are know from the west coast of America: *Cyclaspis nubila* Zimmer, 1936 (Corona del Mar, California), *Cyclaspis giveni* Donath-Hernández, 2011 (Todos Santos bay, Baja California), *Cyclaspis concepcionensis* Donath-Hernández, 1988 (Concepción bay, Baja California), *Cyclaspis bituberculata* Donath-Hernández, 1988 (Bacochibampo bay, Sonora), *Cyclaspis dolera* Zimmer, 1944 (Salinas bay, Costa Rica), *Cyclaspis breedyae* Petrescu & Heard, 2004 (Gulf of Nicoya, Costa Rica), *Cyclaspis vargase* Petrescu & Heard, 2004 (Murciélago island, Costa Rica), *Cyclaspis testudinum* Zimmer, 1943a, (Chatam island, Galápagos); and *Cyclaspis peruana* Zimmer, 1943 (Independencia bay, Perú). *Cyclaspis* sp. nov. 1 females differs of the females of *Cyclaspis* sp. nov. 2 because, (1) *Cyclaspis* sp. nov. 1 has a transparent and elastic body, whereas *Cyclaspis* sp. nov. 2 has a calcareous and opaque body; (2) *Cyclaspis* sp. nov. 1 has one row of setulae on outer margin of basis expansion, while *Cyclaspis* sp. nov. 2 has seven plumose setae. Although *Cyclaspis* sp. nov. 1 is completely different from any other species of *Cyclaspis* previously reported to the Eastern Pacific, the closest species is *C. nubila* and they differ because (3) *Cyclaspis* sp. nov. 1 has the antenna 1 with uniarticulated flagellum, whereas *C. nubila* has the flagellum biarticulated; (4) *Cyclaspis* sp. nov. 1 has the endopod and exopod of uropod with terminal seta fused, whereas *C. nubila* has the terminal seta segmented (Table II).

***Cyclaspis* sp. nov. 2**

(Figs. 6-9)

**Material examined.** Holotype adult male, (UMAR-PERA-490), La Boquilla bay, Puerto Ángel, Oaxaca, 3 m, sandy sediment, 17 November 2007. Paratypes; 8 adult males (one dissected), 1 ovigerous female (dissected), 7 adult females, 1 juvenile (UMAR-PERA-491), same locality and date.

**Diagnosis**. Body is calcareous and opaque. Carapace with three spines on dorsal surface. Antenna 1 with biarticulate flagellum. Female: endopod of uropod with 28 small spines on inner margin; and marsupium with calcified protective layer. Male: endopod of uropod with 18 plumose setae on inner margin.

**Description**. Adult male, 6 mm (Figs. 6A-B). Body is calcareous, opaque and pigmented. Carapace longer than wide; frontal lobe representing approximately 1/2 the length of carapace; ocular lobe with at least three lenses and pigments; carapace with three spines on dorsal surface; carapace with antero-lateral margins crenulate; antennal notch is subacute; short siphons. Pereon about 1/2 the length of carapace; with five segments, the first segment visible only in lateral view; lateral expansion of second pereonite involves the third pereonite; third pereonite is the biggest of all pereonites; lateral expansion of third pereonite involves the fourth pereonite; lateral expansion of fourth pereonite lies on the fifth pereonite. Abdomen is three times the length of pereon; fifth pleonite longer of all pleonites; in lateral view all pleonites have a hook medial joint. With five pairs of pleopods.

Antenna 1 (Fig. 6C) with first article of peduncle longer than the next two articles together; second article shorter and wider than next article; third article two times longer than broad; main flagellum biarticulated, basal article about two times longer than the distal article; accessory flagellum absent. Antenna 2 (Fig. 6D) with five articles; article fifth is the longer than all; flagellum with short articles; flagellum reaches to the end of peduncle of uropod . Right mandible (Fig. 6E) with 11 pinnate setae and one brush of setulae on inner margin, three teeth in lacina mobilis and four teeth in incisor process. Maxilliped 1 and maxilliped 2 similar to female. Maxilliped 3 (Fig. 6F) basis expansion with one spine and 13 setae in total; ischium longer than carpus; ischium and propodus with the same length; merus expanding into the junction with propodus; expansion of merus with one plumo-annulated seta apically and 11 spines in total; propodus longer than dactylus; dactylus with four setae in total.

Pereopod 1 (Fig. 7A) basis longer than the next articles together, with three spines and brush of setulae on outer margin; ischium short; ischium is 1/2 the length of merus; merus shorter than propodus; propodus shorter than dactylus; dactylus with nine setae in total. Pereopod 2 (Fig. 7B) basis shorter than the next articles together, with scales on dorsal surface; ischium is short and bare; dactylus with seven robust setae in total. Pereopod 3 (Fig. 7C) basis with the same length than the next articles together, with three plumo-annulated setae on outer margin; propodus is four times longer than wide; dactylus approximately ½ the length of propodus. Pereopod 4 (Fig. 7D) basis shorter than the

next articles together; merus fused; carpus shorter than propodus; dactylus shorter than propodus, with strong seta. Pereopod 5 (Fig. 7E) basis shorter than the next articles together, with three setae on outer margin; merus shorter than carpus; carpus about two times the length of propodus, with three plumo-annulated setae on inner margin; propodus shorter than dactylus; dactylus with pointed tip. Pleopod 2 (Fig. 7F) with peduncle longer than ramous; endopod uniarticulated; exopod biarticulated, with basal article shorter than distal article.

Uropod (Fig. 7G) peduncle and exopod with the same length, with 18 plumose setae on inner margin; exopod longer than endopod and biarticulated, basal article is 1/3 the length of distal article, distal article with eight plumose setae and three spines on inner margin; endopod uniarticulated, with two small plumose setae, eight pinnate spines and one more large spine on inner margin.

Ovigerous female, 5.3 mm (Fig. 8A). The overall appearance is similar to adult male. Frontal lobe representing approximately 1/3 the length of carapace. Second pereonite longer than all pereonites; lateral expansion of second pereonite involves the first pereonite; marsupium with a slightly calcified and rough protective layer. Without pleopods.

Antenna 1 (Fig. 8B) third article is three times longer than broad. Maxillule (Fig. 8C) with ten spines and four brush of setulae on outer endite; with two simple setae, one pinnate spine and three three-dentate spines on inner endite. Maxilla (Fig. 8E) with 28 setae on inner margin of broad endite, many simple setae on medial narrow endite, and one plumose seta on narrow endite. Left mandible (Fig. 8D) with 13 pinnate setae on inner margin, three teeth in incisor process, molar with one brush of setulae on dorsal surface, the lacina mobilis is absent. Maxilliped 1 (Fig. 8F) basis with the same length than the next articles together; ischium fused; merus broader than long; carpus with 16 setae and few setulae on dorsal surface, with seven bidentate spines on inner margin; propodus about three times the length of dactylus; dactylus with two spines terminally. Maxilliped 2 (Fig. 8G) basis slightly shorter than the next articles together; ischium shorter than merus, bare; merus and carpus with the same length; propodus longer and broader than dactylus; dactylus with three setae and one spine terminally. Maxilliped 3 (Fig. 9A) basis expansion with nine plumose setae in total.

Pereopod 1 (Fig. 9B) basis shorter than the next articles together, with two spines and some setulae on outer margin; merus with one simple seta on outer margin; propodus longer than dactylus; dactylus with 11 setae in total. Pereopod 2 (Fig. 9C) basis with the same length than the next articles together; dorsal suface is bare. Pereopod 3 (Fig. 9D) basis longer than the next articles together, with a bare outer margin. Pereopod 4 (Fig. 9E) with scales on dorsal surface, generally all articles are similar to male. Pereopod 5 (Fig. 9F) carpus with two plumo-annulated setae on inner margin.

Uropod (Fig. 9G) peduncle shorter than ramous, with 28 small spines on inner margin; exopod uniarticulated, with one pinnate spine and two spines terminally on inner margin; endopod uniarticulated, with at least 20 small spines, seven pinnate spines and three spines distally on inner margin.

**Distribution**. La Boquilla bay, Puerto Ángel, Oaxaca; only know for type locality.

**Remarks.** The overall appearance of this new species resembles to *C. breedyae* (Gulf of Nicoya, Costa Rica), but the females are distinguishable from this species by (1) *Cyclaspis* sp. nov. 2 has three spines on dorsal surface of carapace, while *C. breedyae* has four spines; (2) *Cyclaspis* sp. nov. 2 has the first basal article of antenna 1 with one row of setulae on outer margin, whereas in *C. breedyae* has a bare outer margin; (3) *Cyclaspis* sp. nov. 2 has the basis expansion of maxilliped 3 with seven plumose setae on outer margin, while *C. breedyae* has a bare outer margin; (4) *Cyclaspis* sp. nov. 2 has one spine on inner margin of ischium, merus, merus expansion and carpus of maxilliped 3, whereas in *C. breedyae* the inner margin of this articles are bare; (5) *C. breedyae* has the basis of maxilliped 3 with serrated inner margin, while in *Cyclaspis* sp. nov. 2 has a bare inner margin; (6) *Cyclaspis* sp. nov. 2 has the basis of pereopod 1with three spines on outer margin, whereas in *C. breedyae* has a bare outer margin; (7) *Cyclaspis* sp. nov. 2 has the peduncle of uropod with 28 spines on inner margin, while *C. breedyae* the inner margin has 14 spiniform projections; (8) *Cyclaspis* sp. nov. 2 has the endopod of uropod with seven pinnate spines on inner margin, whereas *C. breedyae* the inner margin only has four setulated spines. Additionally the female of *Cyclaspis* sp. nov. 2 differs for females of *Cyclaspis* sp. nov. 1 and the species recognized from the west coast of the America continent by having a calcified protective layer on the marsupium (Table II). We only compare females because the male of *C. breedyae* is unknown.

## Leuconidae Sars, 1878

### *Coricuma* Watling & Breedy, 1988

### *Coricuma* sp. nov.

(Figs. 10-13)

**Material examined**. Holotype adult male (UMAR-PERA-492), Ventura beach, Arriaga, Chiapas, intertidal, mud sediment, 23 September 2011. Paratypes; 4 males (one dissected), 1 ovigerous female (dissected), 4 adult females (UMAR-PERA-493), same locality and date.

**Diagnosis.** Female: Carapace with eight spines on dorsal surface; antenna 1with main flagellum biarticulated; mandible with molar; basis of pereopod 1 with 12 spiniform projections on outer margin; distal article of endopod of uropod present nine spines on inner margin. Male: Carapace with three spines on dorsal surface; last article of antenna 2 witht three grip teeth; basis of pereopod 1 with three spiniform projections on outer margin; distal article of endopod of uropod present eight spines on inner margin.

**Description**. Adult male, 2.1 mm (Figs. 10A-B). Body soft and pigmented; integument finely setose. Carapace about two times longer than wide, with three spiniform projections on dorsal surface; frontal lobe less than 1/2 the length of carapace; distal margins of carapace are crenulated; ocular lobe with pigments; antennal notch is concave, with bare antero-lateral corner. Pereon approximately 1/2 the length of the abdomen, first pereonite is partially covered by the second pereonite. First pleonite is

the smallest of all pleonites; second and third pleonites with the same length; fourth and fifth pleonites with the same proportions; sixth pleonite wider than long, with bilobed tip. With two pleopods.

Antenna 1 (Fig. 10C) first basal article approximately two times longer than wide; second article 2/3 the length of third article; third article three times longer than wide; main flagellum biarticulated, basal article longer than distal article, with three aesthetascs; accessory flagellum small. Antenna 2 (Fig. 10D) with five articles, fourth and fifth article with the same length; fifth article with three griped teeth. Left mandible (Fig. 10E) with three plumose setae and three brush of setulae on inner margin, three teeth in incisor process and two teeth in lacina mobilis. Maxilliped 1 (Fig. 10F-H) basis longer than the next articles together; ischium longer than merus; merus shorter than carpus; carpus longer than propodus, with six setae in total; propodus longer than dactylus, with one plumose seta and two multidentate setae; dactylus with five setae in total; endite with two plumose setae and two hooks on inner margin, with three setae and one spine apically. Maxilliped 2 (Fig. 10I) with ischium fused; merus shorter than carpus; propodus longer than dactylus; dactylus with eight setae in total. Maxilliped 3 (Fig. 11A) with straight basis, outer margin expanded into the junction of the ischium with the merus, with three plumose setae; ischium short; merus about two times the length of ischium; carpus shorter than propodus; propodus approximately three times longer than wide; dactylus about 1/3 the length of propodus, with two brush of setulae, four simple setae and one small pinnate seta; exopod with four articles in flagellum.

Pereopod 1 (Fig. 11B) with six articles; basis shorter than the next articles together, with three spiniform projections on outer margin; merus bare, shorter than carpus; carpus about two times the length of propodus; propodus broader than dactylus; dactylus six times longer than wide, with six setae in total. Pereopod 2 (Fig. 11C) with five articles; basis shorter than the next articles together, with one plumose seta on outer margin; ischium fused; merus shorter than carpus; carpus about two times the length of propodus; propodus shorter than dactylus; dactylus about four times longer than wide, with two long annulated setae apically. Pereopod 3 (Fig. 11D) with six articles; ischium and merus with same proportions; carpus about two times longer than wide; propodus longer than dactylus; dactylus small, with two unequal setae apically. Pereopod 4 (Fig. 11E) with six articles, similar to pereopod 3. Pereopod 5 (Fig. 11F) with five articles; ischium with two plumo-annulated setae; propodus is longer than dactylus; dactylus about ½ the length of propodus, with two annulated setae apically. Pleopod 1 (Fig. 11G) with peduncle approximately three times longer than wide; endopod shorter than exopod, uniarticulated, with five setae in total; exopod biarticulated, the basal article is shorter than distal article. Pleopod 2 (Fig. 11H) with peduncle about two times longer than wide, with 30 small spines on dorsal surface; endopod and exopod with the same length, uniarticulated; exopod biarticulated, basal article longer than distal article.

Uropod (Fig. 11I) with peduncle longer than sixth pleonite, with seven pinnate spines on inner margin. Endopod biarticulated, both articles with the same length, distal article with eight spiniform

projections on inner margin. Exopod biarticulated, distal article five times longer than wide, with one seta on inner margin, and four setae and two setulae apically.

Ovigerous female, 2.0 mm (Figs. 12A-B). The overall appearance is similar to adult male. Carapace with eight spiniform projections on dorsal surface; frontal lobe is 1/5 the length of the carapace; antennal notch is subacute, with at least five spiniform projections on antero-lateral corner. Second pereonite is the longer of all, two times wider than long. Sixth pleonite with rounded tip.

Antenna 1 (Fig. 12C) similar to male, main flagellum with one aesthetasc. Antenna 2 (Fig. 12D) uniarticulated and geniculate, with two papoose setae on outer margin and two plumose setulae apically. Left mandible (Fig. 12E) with four brush of setulae on inner margin, four teeth in incisor process and the lacina mobilis is absent; right mandible (Fig. 12F) with three plumose setae and four brush of setulae on inner margin, three teeth in incisor process and one tooth in lacina mobilis. Maxillule (Fig. 12G) with four apical setae on inner endite and ten spines and five brush of setulae on outer endite. Maxilla (Figs. 12H-I) with three endites; with seven brush of setulae on dorsal surface, with five small plumose setae, one pappose seta, one microserrate seta, nine simple setae and one plumose seta on inner margin of broad endite; with three plumose setae and three simple setae apically on medial narrow endite; with one plumose seta and one simple seta on distal narrow endite. Maxilliped 1 (Figs. 12J-K, 13A) carpus with one plumose seta; dactylus with four setae in total; endite with two setae and one spine apically. Maxilliped 2 (Figs. 13B-C) similar to male, but present many brush of setulae on dorsal surface of basis. Maxilliped 3 (Fig. 13D) similar to male, but show the basis with two plumose setae distally on inner margin; six plumose setae on outer expansion of basis; and the exopod with three articles in flagellum.

Pereopod 1 (Fig. 13E) with five articles; basis with 12 spiniform projections on outer margin; merus armed. Pereopod 2 (Fig. 13F) similar to male, but basis with two plumose setae on outer margin. Pereopod 3 (Fig. 13G) with five articles, ischium shorter than merus; propodus and dactylus with similar proportions. Pereopod 4 (Fig. 13H) similar to pereopod 3, with five articles, but ischium longer than merus. Pereopod 5 (Fig. 13I) similar to male, but dactylus with two unequals annulated setae. Endopod of uropod (Fig. 13J) with nine spines on inner margin of distal article.

**Distribution**. Ventura beach, Arriaga, Chiapas; only know for type locality.

**Remarks**. The only species previously known for this genus is *C.nicoyensis* Watling & Breedy, 1988 (Gulf of Nicoya, Costa Rica); however *Coricuma* sp. nov. resembles to *C. nicoyensis* however is distinguishable from the female of the later species by (1) *Coricuma* sp. nov. has eight medial spiniform projections on dorsal surface of carapace, whereas *C. nicoyensis* has 4-5 spiniform projections; (2) *Coricuma* sp. nov. has first basal article of antenna 1 two times longer than wide, while *C. nicoyensis* has the basal article fused to epistome; (3) *Coricuma* sp. nov. has antenna 1 with main flagellum biarticulated, whereas *C. nicoyensis* has a three-articulated main flagellum; (4) *Coricuma* sp. nov. has mandible with molar, while in *C. nicoyensis* the molar is absent; (5) *Coricuma* sp. nov. has a row of setulae on outer margin of the expansion basis of maxilliped 3, whereas *C.*

*nicoyensis* has a bare outer margin; (6) *Coricuma* sp. nov. has 12 spiniform projections on outer margin of basis of pereopod 1, while *C. nicoyensis* has a bare outer margin; (7) *Coricuma* sp. nov. has nine spines on inner margin the distal article of endopod of uropod, whereas *C. nicoyensis* has six spines; (8) *Coricuma* sp. nov. has four apical setae on distal article of exopod of uropod, while *C. nicoyensis* has five setae. In male, (9) *Coricuma* sp. nov. has three distal grip teeth on the last article of antenna 2, while *C. nicoyensis* has two grip teeth; (10) *Coricuma* sp. nov. has 30 spines on dorsal surface of peduncle of pleopod 2 with, whereas *C. nicoyensis* has several rows of outwardly-directed scales on posterior surface.

## Nannastacidae Bate, 1866

### *Cumella* G.O. Sars 1865

### *Cumella* (*Cumewingia*) sp. nov.

(Figs. 14-17)

**Material examined**. Holotype adult male (UMAR-PERA-494) Corralero lagoon, Pinotepa Nacional, Oaxaca, mangrove substratum, 1 m, 2 December 2009. Paratypes; 27 adult males (one dissected), 4 ovigerous females (one dissected), 12 adult females (UMAR-PERA-495), same locality and date.

**Other material:** 1 ovigerous female, 1 neuter (UMAR-PERA-496), Coral beach, Ixtapa island, Guerrero, 1.5 m, coral rock, 19 September 2007; 6 neuters (UMAR-PERA-497), Panteón beach, Puerto Ángel, Oaxaca, 3 m, coral rock, 23 May 2007; 1 neuter (UMAR-PERA-498), Estacahuite beach, Puerto Ángel, Oaxaca, 5 m, algae on rock, 9 April 2005; 1 neuter (UMAR-PERA-499), Estacahuite beach, Puerto Ángel, Oaxaca, 4 m, coral rock, 1 December 2006; 1 neuter (UMAR-PERA-500), Estacahuite beach, Puerto Ángel, Oaxaca, 1 m, sand substratum, 31 October 2009; 3 neuters (UMAR-PERA-501), La Tijera beach, Pochutla, Oaxaca, 2 m, coral rock, 30 April 2005; 1 neuter (UMAR-PERA-502), La Tijera beach, Pochutla, Oaxaca, 4 m, coral rock, 12 September 2006.

**Diagnosis**. In both sex, dorsal surface is bare; peduncle of uropod is longer than the sixth pleonite. Female: peduncle of uropodal with bare inner margin; endopod of uropod with six pinnate spines on inner margin. Male: with a triangular elevation on dorsal surface of first three pereonites; peduncle of uropod with a maximum of seven pinnate spines on inner margin; endopod of uropod with seven pinnate spines on inner margin.

**Description.** Adult male, 1.7 mm (Figs. 14A-B). Carapace oviform, with smooth surface; frontal lobe is 1/4 the length of carapace; ocular lobe with lenses and pigments; antennal notch like depression; siphons minutes. Pereon with a triangular elevation on dorsal surface. Sixth pleonite shorter than the peduncle of uropod. Exopods present in maxilliped 3 and pereopods 1-4. Pleopods are absent.

Antenna 1 (Fig. 14C) first basal article shorter than the next two articles together; second article broader than third article; main flagellum biarticulated; accessory flagellum uniarticulated and reduced. Antenna 2 (Fig. 14D) flagellum with long articles. Mandible (Fig. 14E) with five simple

setae on inner margin, three teeth in incisor process and four teeth in lacinia mobilis. Maxillule (Fig. 14F) with nine spines terminally and five brush of setulae on outer endite; with four setae and one brush of setulae inner endite; palp with one seta. Maxilliped 2 (Fig. 14G) basis with the same length than the next four articles together; ischium short, bare; carpus broader than propodus; propodus longer than dactylus, with four short plumose setae on dorsal surface; dactylus about ½ the length of propodus, with one pointed spine apically. Maxilliped 3 (Fig. 15A) basis arcuate, longer than the next articles together, outer margin with a bidentate endite distally and three plumose setae; ischium fused; carpus broader than propodus; propodus narrow at base, curved; dactylus short, with one pointed spine apically.

Pereopod 1 (Fig. 15B) with basis expanded and a distal hyaline lamella on inner margin; ischium shorter than merus; merus shorter than carpus; carpus longer than propodus; propodus longer than dactylus; dactylus about 1/2 the length of propodus, with two apical setae. Pereopod 2 (Fig. 15C) basis expanded and longer than the next articles together; ischium reduced, bare; merus and carpus with the same length; propodus is ½ the length of dactylus; dactylus with six robust spines in total. Pereopod 3 (Fig. 15D) basis expanded; ischium shorther than merus; merus shorter than carpus; carpus about two times the length of propodus; propodus broader than dactylus; dactylus with fused apical seta. Pereopod 4 (Fig. 15E) basis longer than the next articles together, with bare inner margin; ischium shorter than merus; merus shorter than propodus; carpus about three times longer than wide; propodus shorter than dactylus; dactylus bare, with fused apical seta. Pereopod 5 (Fig. 15F) with ischium shorter than merus; carpus is 1/2 the length of propodus; propodus about three times longer than wide; dactylus approximately 1/2 the length of propodus, with apical seta fused.

Uropod (Fig. 15G) peduncles longer than ramous, seven pinnate spines and rows of setulae on inner margin; endopod and exopod with the same length; exopod biarticulated, basal article is ¼ the length of distal article; endopod uniarticulated, with seven pinnate spines and one row of setulae on inner margin.

Ovigerous female, 2.0 mm (Fig. 16A). The overall appearance is similar to adult male. In lateral view, carapace with bare antero-lateral margin; ocular lobe only with pigments; antennal notch is weak. Pereonite 2 and 3 expanded. Exopods present in maxilliped 3 and pereopods 1-2.

Antenna 1 (Fig. 16B) similar to male, but accessory flagellum approximately ½ the length of the basal article of main flagellum. Labium (Fig. 16D) with one row of setulae distally on inner margin; lobe with two teeth and one brush of setulae. Mandible (Fig. 16E) with six plumose setae on inner margin, two teeth in incisor process and one tooth in lacinia mobilis. Maxillule (Fig. 16C) with ten spines terminally and a row of setulae on outer endite; palp with two setae. Maxilla (Fig. 16F) with 15 setae on inner margin of broad endite, nine setae on medial narrow endite and ten setae on distal narrow endite. Maxilliped 1 (Fig. 16G) with ischium fused; merus wider than long; carpus with five bifurcated teeth on inner margin; propodus longer than wide; dactylus short, with four simple setae apically; endite with two simple setae on dorsal surface, five plumose setae and two hooks on inner

margin, and three flattened teeth, one pinnate and three simple setae terminally. Maxilliped 2 (Fig. 16H) similar to male, but propodus with two plumose setae on dorsal surface, and dactylus with one bi-pinnate seta apically. Maxilliped 3 similar to male.

Pereopod 1 (Fig. 17A) basis with bare inner margin; dactylus with four apical setae. Pereopod 2 (Fig. 17B) with basis shorter than the next articles together; merus shorter than carpus; dactylus with seven robust setae in total. Pereopod 3 (Fig. 17C) basis longer than wide; ischium bigger than male; carpus with one annulated seta apically on dorsal surface and one seta medially on inner margin; dactylus with terminal seta fused. Pereopod 4 (Fig. 17D) basis longer than wide, with two setae on inner margin; propodus and dactylus with the same length. Pereopod 5 (Fig. 17E) carpus more than ½ the length of propodus; dactylus and propodus approximately with the same length.

Uropod (Fig. 17F) peduncle with bare inner margin; exopod similar to male; endopod with six pinnate spines on inner margin.

**Distribution**. Coast of Guerrero and Oaxaca, México.

**Remarks.** On the coast of the America continent only nine species of the genus *Cumella*, subgenus *Cumewingia* Bacescu, 1971 are eight know from Atlantic side: *Cumella* (*Cumewingia*) *somersi* Petrescu & Sterrer, 2001 (Devonshire bay, Bermuda), *Cumella* (*Cumewingia*) *anae* Petrescu & Iliffe, 1992 (Andros island, Bahamas), *Cumella* (*Cumewingia*) *angelae* Petrescu & Iliffe, 1992 (Andros island, Bahamas), *Cumella* (*Cumewingia*) *bacescui* Petrescu & Iliffe, 1992 (Andros island, Bahamas), *Cumella* (*Cumewingia*) *caribbeana* Bacescu, 1971 (Tavernik Key, Florida), *Cumella* (*Cumewingia*) *clavicauda* Calman, 1911 (Cruz bay, Virgin Islands), *Cumella* (*Cumewingia*) *serrata* Calman, 1911 (Cruz bay, Virgin Islands), and *Cumella* (*Cumewingia*) *leptopus* Calman, 1911 (Cruz bay, Virgin Islands). From the Pacific previosly was described *Cumella* (*Cumewingia*) *quintinensis* Donath-Hernández, 2011 (San Quintín bay, Baja California).

*Cumella* (*Cumewingia*) sp. nov. differs from the females Atlantic species by (1) *C.C. somersi* and *C.C. serrata* have spines on dorsal surface of carapace, whereas *Cumella* (*Cumewingia*) sp. nov. has a bare dorsal surface; (2) *C.C. anae*, *C.C. angelae* and *C.C. clavicauda* have the peduncle of uropod shorter than sixth pleonite, while *Cumella* (*Cumewingia*) sp. nov. has the peduncle longer than sixth pleonite; (3) *C.C. basescui* and *C.C. leptopus* have a elevation on carapace, whereas *Cumella* (*Cumewingia*) sp. nov. has a flat carapace; with respect to the male differens, (4) *C.C. caribbeana* has the basis of pereopod 2 with ten spines on inner margin, while *Cumella* (*Cumewingia*) sp. nov. has a bare inner margin.

In addition *Cumella* (*Cumewingia*) sp. nov. is distinguishable from the male *C.* (*C.*) *quintinensis* by (5) *Cumella* (*Cumewingia*) sp. nov. has pigments on ocular lobes, whereas *C.* (*C.*) *quintinensis* the pigments are absent; (6) *Cumella* (*Cumewingia*) sp. nov. has the carapace with dorso-lateral ridges, while in *C.C. quintinensis* the dorso-lateral ridges are absent; (7) *Cumella* (*Cumewingia*) sp. nov. has a triangular elevation on dorsal surface of first three pereonites, while *C.C. quintinensis* the elevation is absent; (8) *Cumella* (*Cumewingia*) sp. nov. has the peduncle of uropod with seven pinnate spines on

inner margin, whereas *C.C. quintinensis* has ten spines; (9) *Cumella* (*Cumewingia*) sp. nov. has seven pinnate spines on inner margin of endopod of uropod, while *C.C. quintinensis* has six spines; (10) *Cumella* (*Cumewingia*) sp. nov. has the exopod and endopod of uropod with similar length, whereas *C.C. quintinensis* has the exopod shorter than endopod. With respect to females (11) *Cumella* (*Cumewingia*) sp. nov. has a bare inner margin of peduncle of uropod, while *C.C. quintinensis* has 5-7 spines; (12) *Cumella* (*Cumewingia*) sp. nov. has six pinnate spines on inner margin of endopod of uropod with, whereas *C.C. quintinensis* has two spines.

### *Elassocumella* Watling, 1991

### *Elassocumella* sp. nov.

(Figs. 18-21)

**Material examined.** Holotype adult male (UMAR-PERA-503), Mazunte beach, Tonameca, Oaxaca, 9.14 m, in *Pocillopora damicornis* Linnaeus, 1758, 11 August 2011. Paratypes; 19 adult males, 63 ovigerous females, 31 adult females, 18 juveniles (UMAR-PERA-504), same locality and date.

**Other material:** 1 neuter (UMAR-PERA-505), Coral beach, Ixtapa island, Guerrero, 1.5 m, coral rock, 19 September 2007; 1 adult female (UMAR-PERA-506), Carrizalillo beach, Puerto Escondido, Oaxaca, depth unknown, bivalve epibiont, 16 October 2006; 11 adult females (UMAR-PERA-507), Camarón beach, Zipolite, Oaxaca, littoral, rocks, 12 November 2009; 1 adult female, 1 juvenile (UMAR-PERA-508), Camarón beach, Zipolite, Oaxaca, littoral, sand substratum, 12 November 2009; 1 adult male (UMAR-PERA-509), Camarón beach, Zipolite, Oaxaca, intertidal, anemones, 20 May 2011; 7 ovigerous females, 3 adult males, 1 juvenile (UMAR-PERA-510), Panteón beach, Puerto Ángel, Oaxaca, 3 m, coral rock, 23 March 2007; 1 ovigerous female (UMAR-PERA-511), La Tijera beach, Pochutla, Oaxaca, 4 m, coral rock, 30 April 2005; 1 ovigerous female, 1 adult female, 1 juvenile (UMAR-PERA-512), La Tijera beach, Pochutla, Oaxaca, 4 m, coral rock, 12 September 2006; 2 adult females, 1 juvenile (UMAR-PERA-513), Estacahuite beach, Puerto Ángel, Oaxaca, 2-3 m, sabellariid colony, 10 September 2005; 1 ovigerous female, 1 adult male (UMAR-PERA-514), Estacahuite beach, Puerto Ángel, Oaxaca, 2-3 m, algae, 10 September 2005; 11 ovigerous females, 13 adult males, 15 juveniles (UMAR-PERA-515), Estacahuite beach, Puerto Ángel, Oaxaca, 4 m, coral rock, 25 October 2006; 8 ovigerous females, 3 adult males, 1 juvenile (UMAR-PERA-516), Estacahuite beach, Puerto Ángel, Oaxaca, 4 m, coral rock, 1 December 2006; 8 ovigerous females, 11 adult females, 3 neuters (UMAR-PERA-517), San Agustín bay, Huatulco, Oaxaca, depth unknown, *P. damicornis*, 23 February 2010; 1 ovigerous female (UMAR-PERA-518), Maguey bay, Huatulco, Oaxaca, intertidal, sand substratum, 4 July 2007.

**Diagnosis**. Carapace with many spiniform projections on antero-lateral corner. With continuous branchial concavity. Pereon with dorsal surface armed. Abdomen shorter than carapace and pereon together. Uropods shorter than sixth pleonite.

**Description**. Adult male, 1.9 mm (Figs. 18A-B). Carapace shorter than pereon and abdomen together, with long setulae on dorsal surface; frontal lobe and carapace with the same length; ocular lobe with lenses and pigments; pseudorostral lobe is crenulate anteriorly; pereonites broader than long and with crenulate lateral margins, first two pereonites with spiniform projections on dorsal surface; pleonites longer than wide and with crenulate lateral margins; uropods shorter than sixth pleonite.

Antenna 1 (Fig. 18C) first basal article shorter than the next articles together; second article shorter than third article; main flagellum biarticulated; accessory flagellum uniarticulated, with three setae apically. Antenna 2 (Fig. 18D) with four articles; fourth article longer than all articles, flagellum with long articles and extending beyond abdomen. Labium (Fig. 18H) with one plumose seta on dorsal surface and bilobulated endite. Mandible (Fig. 18G) with six setae on inner margin, incisor process lost, with three teeth in lacina mobilis. Maxillule (Fig. 18E) with ten spines apically on outer endite; one plumose seta, one three-dentate seta and one simple seta on inner endite. Maxilla (Fig. 18F) with seven setulae and six setae on broader endite, six setae on medial narrow endite, and seven simple setae on distal narrow endite. Maxilliped 2 (Fig. 18I) with ischium narrow at base; merus and carpus with the same length; carpus longer than propodus; propodus is broader than dactylus; dactylus with pointed tip. Maxilliped 3 (Fig. 19A) with basis expanded and setulae on inner margin; ischium is longer than merus; merus longer than carpus; propodus longer than dactylus; dactylus with one robust seta apically.

Pereopod 1 (Fig. 19B) basis expanded, with eight spiniform projections on inner margin; ischium and merus with the same length; carpus longer than propodus; propodus approximately two times the length of dactylus; dactylus with six setae in total. Pereopod 2 (Fig. 19C) expanded, with crenulated hyaline lamella on inner margin; ischium fused; merus and carpus with similar proportions; carpus longer than propodus; propodus shorter than dactylus, bare; dactylus about three times longer than wide, with eight setae in total. Pereopod 3 (Fig. 19D) basis expanded; ischium short; merus shorter than carpus; carpus and propodus with the same length; propodus longer than dactylus; dactylus with curved and pointed tip. Pereopod 4 (Fig. 19E) basis with similar length than the next articles together; ischium short; merus longer than carpus; carpus is shorter than propodus; propodus longer than dactylus; dactylus with curved and pointed tip. Pereopod 5 (Fig. 19F) basis shorter than the next articles together, with setulae on dorsal surface; ischium shorter than merus, bare; merus shorter than carpus; carpus and propodus with similar length; propodus longer than dactylus; dactylus with strong and curved tip.

Uropod (Fig. 19G) short and robust; peduncle shorter than sixth, with five setae on dorsal surface and two spines apically on inner margin; exopod biarticulated and basal article shorter than distal article; endopod longer than exopod and uniarticulated.

Ovigerous female, 1.8 mm (Figs. 20A-B). The overall appearance is similar to adult male. Carapace with small spiniform projections on dorsal surface; frontal lobe is 1/3 the length of carapace;

ocular lobe only with pigments. In lateral view, carapace with many spiniform projections on antero-lateral corner; with continuous branchial concavity.

Antenna 1 (Fig. 20C) similar to male, but second and third basal articles with plumose setulae on dorsal surface. Maxilliped 1 (Fig. 20F) basis with one row of setulae; ischium fused; merus expanded; carpus broader than propudus, with seven teeth on inner margin; propodus longer than dactylus; dactylus with three setae, one of them robust. Maxilliped 2 (Fig. 20D) with merus shorter than carpus; dactylus with three-dentate tip. Maxilliped 3 (Fig. 20E) basis with six plumose setae on inner margin; ischium short than merus; dactylus with pointed and curved tip.

Pereopod 1 (Fig. 21A) basis longer than wide, with bare inner margin; carpus and propudus with similar length; propodus shorter than dactylus; dactylus with strong and pointed seta. Pereopod 2 (Fig. 21B) basis expanded, with three plumose setae on inner margin; ischium short, bare; merus broader than carpus; with nine setae in total; propodus about 1/3 the length of dactylus; dactylus with nine spines distally. Pereopod 3 (Fig. 21C) with basis longer than wide; merus is longer than carpus; carpus shorter than propodus. Pereopod 4 (Fig. 21D) basis shorter than the next articles together. Pereopod 5 (Fig. 21E) basis with seven setae on dorsal surface; carpus shorter than propodus; dactylus robust tip.

Uropod (Fig. 21F) peduncle with three setae on dorsal surface and two pinnate setae on inner margin; exopod and endopod with a strong and pointed spine apically.

**Distribution**. Coast of Guerrero and Oaxaca, México.

**Remarks.** The only species previously known for this genus is *Elassocumella micruropus* (Zimmer, 1943b) described from Florida, western Atlantic. The comparison with this species is based in the more detailed redescription of Bacescu & Muradian (1977) because present a more detailed description and drawings of this species. We only compare females because the male of *E. micruropus* is unknown.

*Elassocumella* sp. nov. resembles to *E. micruropus* but is distinguishable from this species by (1) *Elassocumella* sp. nov. has a continuous branchial concavity, while *E. micruropus* has the branchial area disrupted by a gentle depression; (2) *Elassocumella* sp. nov. has the carapace with many spiniform projections on anterolateral corner, whereas *E. micruropus* has a bare anterolateral corner; (3) *Elassocumella* sp. nov. has the abdomen longer than carapace, whereas *E. micruropus* has the abdomen and carapace with the same length; (4) *Elassocumella* sp. nov. has one row of setulae on the dorsal surface of merus and carpus of maxilliped 1, while *E. micruropus* has bare dorsal surface in these segments; (5) *Elassocumella* sp. nov. has a bare outer margin of merus of maxilliped 1, whereas *E. micruropus* has some setulae on outer margin; (6) *Elassocumella* sp. nov. has many setulae on each article of pereopod 1, while *E. micruropus* has only few setulae on propodus; (7) *Elassocumella* sp. nov. has bare dorsal surface of basis and ischium of pereopod 1, whereas *E. micruropus* has one spine on each segment; (8) *Elassocumella* sp. nov. has two plumose setae distally on outer margin of basis of pereopod 1, while *E. micruropus* has three simple setae; (9) *Elassocumella* sp. nov. has four setulae on dorsal surface of basis of pereopod 3, while *E. micruropus* has 16 brush of setulae; (10)

*Elassocumella* sp. nov. has two distal plumose setae on inner margin of peduncle of uropod, while *E. micruropus* has two spines; (13) *Elassocumella* sp. nov. has six setulae on dorsal surface of first article of exopod of uropod, whereas *E. micruropus* has three tubercles.

***Schizotrema* Calman, 1911**

***Schizotrema* sp. nov.**

(Figs. 22-25)

**Material examined.** Holotype adult male (UMAR-PERA-519), San Agustín bay, Huatulco, Oaxaca, in *P. damicornis*, littoral, 23 February 2010. Paratypes; 1ovigerous female (UMAR-PERA-520), Coral beach, Ixtapa island, Guerrero, coral rocks, 1.5 m, 19 September 2007; 4 ovigerous females, 6 adult females, 27 neuters (UMAR-PERA-521), San Agustín bay, Huatulco, Oaxaca, in *P. damicornis*, littoral, 23 February 2010.

**Diagnosis**. In both sex the carapace has five pair of setae on dorsal surface and three spines on each lateral margin of fifth pleonite. Female with six spines on each lateral margin of carapace. Male with seven spines on each lateral margin of carapace.

**Description**. Adult male, 2.3 mm (Figs. 22A-B). Body flattened. Carapace with seven spines on each lateral margin and five pairs of setulae on dorsal surface; long siphons; frontal lobe is approximately ½ the length of carapace. All pereonites and first three pleonites with spines and tubercles on dorsal surface; second and third pleonites with two spines on each lateral margin; fifth pleonite with three pairs of spines; sixth pleonite is shorter than uropod.

Antenna 1 (Fig. 22C) first basal article longer than the next two articles together; second article broader and shorter than third article; main flagellum three-articulated; accessory flagellum uniarticulated, with six setulae. Mandible (Fig. 22D) with six setae on inner margin, three teeth in incisor process and lacina mobilis absent. Maxilliped 1 similar to female, dactylus modified in a globular structure (Fig. 22E), like “strawberry”. Maxilliped 2 (Fig. 22F) basis straight, shorter than the next articles together; ischium short, bare; merus narrow at base, with brush of setulae on dorsal surface; carpus and propodus with the same length; propodus broader than dactylus; dactylus shorter than propodus, with one strong and serrated spine apically. Maxilliped 3 (Fig. 23A) basis broad, with three long plumose setae on dorsal surface; ischium short, bare; merus shorter than carpus; carpus and propodus with the same length; propodus longer than dactylus; dactylus with two strong serrated spines apically.

Pereopod 1 (Fig. 23B) with basis shorter than the next articles together, ischium short; merus is approxemately 1/2 the length of carpus; carpus and propodus with similar length; propodus shorter than dactylus; dactylus with one pointed and bipinnated tip. Pereopod 3 (Fig. 23C) basis broad and shorter than the next articles together, and bare dorsal surface; ischium about two times the length of merus; merus broader than carpus; carpus shorter than propodus; propodus longer than dactylus, bare;

dactylus curved, with terminal seta fused. Pereopod 4 (Fig. 23D) basis broad; ischium reduced, bare; merus longer than carpus; carpus longer than propodus; propodus shorter than dactylus, bare; dactylus curved, with terminal seta fused. Pereopod 5 (Fig. 23E) basis shorter than the next articles together; ischium shorter than merus, bare; merus shorter than carpus; carpus and propodus with the same length; propudus shorter than dactylus; dactylus strong and curved, with terminal seta fused.

Uropod (Fig. 22G) peduncle shorter than ramous; exopod shorter than endopod and biarticulated, basal article about 1/3 the length of distal article, distal article with one long seta apically; endopod uniarticulated and with one strong seta apically.

Ovigerous female, 2.0 mm (Fig. 24A). The overall appearance is similar to adult male. Carapace with six spines on each lateral margin; second and third pleonites with one spine on each lateral margin.

Antenna 1 (Fig. 24B) with main flagellum biarticulated; accessory flagellum with three setulae. Labium (Fig. 24D) with some setulae and one small spine on endite. Mandible (Fig. 24C) with one spiniform projection on molar. Maxillule (Fig. 24E) with nine spines on outer endite and one plumose seta, one three-dentate seta and one more simple seta on inner endite; palp with two setae. Maxilla (Fig. 24F) with 15 and three plumose setulae on inner margin of broad endite, four setae on medial narrow endite, and three setae on distal narrow. Maxilliped 1 (Fig. 24I) with fused ischium; merus broader than long; carpus broader than propodus, with six three-dentate teeth on inner margin; propodus longer than dactylus; endite with two hooks on inner margin, two stout process, three setae apically. Maxilliped 2 (Figs. 24G-H) similar to male, with ischium fused. Maxilliped 3 (Fig. 25A) basis narrow, with five long plumose setae on dorsal surface; ischium fused; carpus longer than propodus.

Pereopod 1 similar to male. Pereopod 2 (Fig. 25B) basis partially lost; ischium reduced, bare; merus shorter than carpus; carpus narrow at base; propodus shorter than dactylus; dactylus with five strong setae in total. Pereopod 3 (Fig. 25C) basis narrow, longer than the next articles together and with setulae on dorsal surface; carpus broader than merus. Pereopod 4 (Fig. 25D) with basis narrow; ischium and merus with the same length; carpus shorter than propodus. Pereopod 5 (Fig. 25E) ischium with one spine on inner margin; carpus shorter than propodus; propodus longer than dactylus; dactylus with a strong and curved spine apically.

Uropod (Fig. 25F) similar to male, but the exopod with basal article about 1/5 the length of distal article.

**Distribution**. Coast of Guerrero and Oaxaca, México.

**Remarks**. From the Atlantic coast of America, were described three species of the genus *Schizotrema*, no any from the eastern Pacific: *Schizotrema agglutinanta* (Bacescu, 1971) from Tavernik Key, Florida; *Schizotrema wittmanni* Petrescu & Sterrer, 2001 (Eastern Blue Cut, Bermuda); and *Schizotrema watlingi* Petrescu, 2002 (Twin Cays, Belize). *Schizotrema* sp. nov. differs of the three species because has spines on carapace, while in the Atlantic species the carapace is smooth. The only

other species that show spines on carapace, *Schizotrema depressum* Calman, 1911, was described from the Gulf of Siam, Thailand; but *Schizotrema* sp. nov. differs from this species because (1) *Schizotrema* sp. nov. has the frontal lobe longer than pseudorostral lobe, whereas *S. depressum* has the frontal lobe shorter than pseudorostral lobe; (2) *Schizotrema* sp. nov. has five pairs of setulae on dorsal surface of carapace, while *S. depressum* has a bare dorsal surface; *Schizotrema* sp. nov. has six spines on each lateral margin of carapace, while *S. depressum* has 11 spines; (3) *Schizotrema* sp. nov. has spiniform projections on dorsal surface of pereon and pleonites, whereas *S. depressum* has a bare dorsal surface; (4) *Schizotrema* sp. nov. has two spines on each lateral margin of first pereonite, whereas *S. depressum* has one distal spine; (5) *Schizotrema* sp. nov. has the first pleonite with one distal spine on each lateral margin, while *S. depressum* has a bare lateral margin spine; (6) *Schizotrema* sp. nov. has three spines on each lateral margin of fifth pleonite, whereas *S. depressum* has two spines; (7) *Schizotrema* sp. nov. has the pereopod 4 with carpus shorter than propodus, while *S. depressum* has the carpus and propodus with the same length; (8) *Schizotrema* sp. nov. has the uropod with endopod longer than exopod, while *S. depressum* has this articles with the same length. We only compare females because the male of *S. depressum* is unknown.

## Discussion and conclusion

The examination of 378 specimens resulted in six new species described for the Mexican South Pacific: *Cyclaspis* sp. nov. 1, *Cyclaspis* sp. nov. 2, *Coricuma* sp. nov., *Cumella* (*Cumewingia*) sp. nov., *Elassocumella* sp. nov., and *Schizotrema* sp. nov.

The distributional range of the genus *Coricuma* is extended from the Gulf of Nicoya, Costa Rica, to Chiapas, México without intermedius records; also this new species is the second species described in the world. On the other hand the genera *Elassocumella* and *Schizotrema* are recorded by first time in the Eastern Pacific, *Elassocumella* was previously recorded from the Gulf of México and Caribbean Sea, whereas *Schizotrema* was previously recorded in the Indian and Atlantic Oceans.

With this work the cumacean fauna from the Tropical Eastern Pacific increases from 24 to 30 species. Previously to this work in the entire TEP subregion, the Panamic and Cortés Provinces were considered the areas with the highest number of littoral records (10 species), followed by Galápagos Province with two species, and the Mexican Province without records. Now the Mexican Province is the second province with more records (six species) in the Tropica Eastern Pacific.

The previous works indicate that the sampling effort has been sporadic in time and coverage, maybe is the main reason for an incomplete knowledge of cumaceans fauna in the region. In order to facilitate and clarify the systemic problems of the group, it is necessary to create tools (e.g. identification keys, catalogs and regional faunal lists), and have access to to old papers and monographs, summaryzing the information in a clearly and concisely way, in order to increase the awareness of species richness.

## Key for cumaceans from Eastern Tropical Pacific

### Key A: Families

(Modified from Heard *et al*. 2007)

1 Telson distinct and articulated, not fused to sixth pleonite; endopod of uropod usually three-articulate (Fig. 30D) ..... Diastylidae

- Telson indistinct, fused to sixth pleonite; endopod of uropod usually uniarticulated (Fig. 30I). .....2

2(1) Males with five pairs of pleopods (Fig. 26H).....Bodotriidae

- Males without pleopods or with only two pairs of pleopods.....3

3(2) Males with only two pairs of pleopods (Fig. 10B). Endopod of uropod biarticulated (Fig. 10I) .....Leuconidae

- Males without pleopods (Fig. 27L); endopod of uropod uniarticulated (Fig. 30H) ..... ..... Nannastacidae

### Family Bodotriidae

### Key A: Subfamily, Genus and Species

(Modified from Haye, 2007)

1 Exopods present only on first pereopod…….Subfamily Bodotriinae…… [Branchial siphons short; endopod of uropod uniarticulated]……*Cyclaspis*.....2

- Exopods present beyond first pereopod……Subfamily Vaunthompsoniinae…….[First free thoracic segment not visible; exopod of pereopod 4 reduced in male and female; pereopod 2 with distal brush of setae on propodus and dactylus, spines absent (Fig. 28Q)]…….. ..... .....*Leptocuma forsmani* ♀ (Fig. 26A)

2(1) Female peduncle of uropod with armed inner margin.....3

- Female peduncle of uropod with unarmed inner margin.....8

3(2) Terminal end shape of whole width extension of sixth pleonite like a line; endopod of uropod serrated, with minute spines and five setae on inner margin (Fig. 29H); antennal notch as depression.....*C. testudinum* ♀ (Fig. 26B)

- Terminal end shape of whole width extension of sixth pleonite not like a line; endopod of uropod not serrated, with well defined spines or setae on inner margin; antennal notch as subacute incision .....4

4(3) Terminal end shape of whole width extension of sixth pleonite concaved; pereopod 1 with carpus and propodus with the same length (Fig. 29A); peduncle of uropod with four spines on inner margin; endopod of uropod with two spines and six spiniforms projections on inner margin (Fig. 29I) .....*C. bituberculata* ♀ (Fig. 26C)

- Terminal end shape of whole width extension of sixth pleonite pointed; pereopod 1 with carpus longer than propodus; peduncle of uropod with more than four spines on inner margin .....5

5(4) Carapace frontal lobe extension somewhat extended (Figs. 28C-D).....6

- Carapace frontal lobe extension anteriorly linguiform (Figs. 28A-B).....10

6(5) Antenna 1 first basal article longer than the other two articles together; pereopod 1 with subtriangular tooth on inner apical angle of basis .....7

- Antenna 1 first basal article shorter than the other two articles together (Fig. 28J); pereopod 1 without process on inner apical angle of basis (Fig. 29C). [Peduncle of uropod with about 14 small spines on inner margin; endopod of uropod with four spines on inner margin (Fig. 29J] .....*C. breedyae* ♀ (Fig. 26E)

7(6) Endopod of uropod with two small plumose setae, without small spines and eight pinnate spines on inner margin; peduncle of uropod with four long plumose setae and 14 medium plumose setae on inner margin (Fig. 7G) ..... *Cyclaspis* sp. nov. 2 ♂ (Figs. 6A-B)

- Endopod of uropod without setae, with 20 small spines and seven pinnate spines on inner margin; peduncle of uropod with 28 spines on inner margin (Fig. 9G)… ..... .....*Cyclaspis* sp. nov. 2 ♀ (Fig. 8A)

8(2) Dactylus of pereopod 1 ten times longer than wide (Fig. 29D); peduncle of uropod with small simple setae on inner margin; endopod of uropod shorter than exopod, with many simple setae and without spines on inner margin (Fig. 29K).....*C. dolera* ♀ (Fig. 26E)

- Dactylus of pereopod 1 four times longer than wide (Fig. 29B); peduncle of uropod without small simple setae on inner margin; endopod of uropod longer than exopod, with plumose setae and spines on inner margin.....9

9(8) Peduncle of uropod with serrated inner margin; endopod of uropod with serrated inner margin, and three spines (Fig. 29L).....*C. vargasae* ♀ (Fig. 26F)

- Peduncle of uropod not serrated, with at least 20 plumose setae on inner margin; endopod of uropod without serrated inner margin, only with three plumose setae and five spines (Fig. 30M) ..... *C. vargasae* ♂

10(5) Terminal end shape of whole width extension of sixth pleonite like a line; female endopod of uropod with serrated inner margin.....11

- Terminal end shape of whole width extension of sixth pleonite not like a line; female endopod of uropod without serrated inner margin .....12

11(10) Carapace without lenses (Fig. 28C); endopod of uropod with six spiniform projections on inner margin; exopod of uropod with two spiniform projections and three spines apically (Figs. 29N-O) ..... *C. concepcionensis* ♀ (Fig. 26I)

- Carapace with nine lenses (Fig. 28D); endopod of uropod with five small plumose setae, two spines and five spiniform projections on inner margin; exopod of uropod with two plumose setae and four spiniform projections (Fig. 29P-Q) ..... *C. concepcionensis* ♂

12(10) Terminal end shape of whole width extension of sixth pleonite is pointed.....
..... *Cyclaspis* sp. C (sensu Donath-Hernández, 1985) (Figs. 26G-H)

- Terminal end shape of whole width extension of sixth pleonite with rounded apex.....13

13(12) Female endopod of uropod with two spines on inner margin .....14

- Female endopod of uropod with nine spines on inner margin (Fig. 29R).....
..... *C. nubila* (Fig. 26J)

14(13) Carapace with three lenses ..... *Cyclaspis* sp. nov. 1 ♂ (Fig. 2A)

- Carapace without lenses, only with pigments ..... *Cyclaspis* sp. nov. 1 ♀ (Fig. 4A)

## Family Diastylidae

## Key B: Genus and Species

(Modified from Jones, 1969; Day, 1980; Watling & McCann, 1997**)**

1 Telson longer than the last pleonite.……*Leptostylis*…….[Carapace smooth; pereopod 1 with carpus shorter than propodus; uropod with exopod shorter than endopod; antennal flagellum of adult male not reaching beyond end of pereon (Fig. 30A)].....
.....*L. menziesi* ♂ (Fig. 26K)

- Telson shorter than the last pleonite.....2

2(1) With short post-anal part of telson .....3

- With long and narrowed post-anal part of telson.....6

3(2) Pseudorostrum as long as or longer than carapace (Fig. 28E)……*Vermakylindrus* .....4

- Pseudorostrum short, about ¼ the length of carapace (Fig. 28G)……*Makrokylindrus*.....5

4(3) With prominent spines on dorsal surface of body (Fig. 28F); first article of endopod of uropod with seven spines on outer margin (Fig. 30B)..... *V. costaricanus* ♀ (Fig. 27A)

- Without prominent spines on dorsal surface of body (Fig. 28E); first article of endopod of uropod with two spines on outer margin (Fig. 30C)..... *V. gladiger* ♀ (Fig. 27B)

5(4) Third and fourth pereonites not coalesced dorsally; carapace with many slender spines on dorsal surface; telson without serrate lateral margins (Fig. 29G).... *M. americanus* ♂ (Fig. 27C)

- Third and fourth pereonites coalesced dorsally; carapace with spines, setae and denticles on dorsal surface (Fig. 28G); telson with serrate lateral margins (Fig. 29F).....
.....*M. menziesi* ♂ (Fig. 27D)

6(2) Telson without apical spines……*Oxyurostylis* .....7

- Telson with apical spines. [Short telson, with two or more pairs of setae; male with elongate antennules and with sensory setae on distal articles; pereopods 2-3 of female not widely separated]……*Diastylis*.....8

7(6) Peduncle of uropod about 16 spines on inner margin; exopod of uropod and endopod with subequal length (Fig. 30D). [Exopod of uropod with 4-5 pairs of spines on inner margin and two long terminal spines; endopod with ten spines on inner margin and two terminal spines]... ..... *O. pacifica* ♀ (Fig. 27E)

- Peduncle of uropod with 11-12 spines on inner margin; exopod of uropod longer than endopod (Fig. 30E)..... *O. tertia* ♀

8(6) Both sides of the carapace with a strong lateral tooth at the base of ocular lobe (Fig. 28H). [Telson with three spines laterally and two terminal minute spines; endopod of uropod 3-articulated, with 6-8 spines on inner margin and one terminal spine; exopod of uropod slightly smallest than the endopod, with a pair of spines terminaly (Fig. 30F)] ..... ..... *D. calderoni* ♀ (Fig. 27F)

- Both sides of the carapace without strong lateral tooth at the base of ocular lobe.....9

9(8) Carapace narrow at base, with strong elevated ridges or keel and three lenses (Fig.28I) ..... ..... *D. californica* ♀ (Fig. 27G)

- Carapace broad at base, without strong elevated ridges or keels and without lenses..... ..... ?*D. tenebricosa* ♀ (Fig. 27H)

## Families Leuconidae and Nannastacidae

## Key C: Genus and Species

(Modified from Watling, 1991a-b; Watling & McCann, 1997; Corbera *et al*. 2008)

1 Endopod of uropod uniarticulated……Nannastacidae.....4

- Endopod of uropod biarticulated……...Leuconidae.....2

2(1) Ocular lobe with distinct lenses or pigments; male antenna 2 not extending along pleon; male pereopod 1 with dactylus and propodus with subequal length…….....*Coricuma* .....3

- Ocular lobe without lenses or pigments; male antenna 2 extending along pleon; male pereopod 1 with dactylus about 1/2 the length of propodus…….*Leucon*..... ..... *L.* (*Crymoleucon*) *bishopi* ♀ (Fig. 27I)

3(2) Male with two clasping teeth on the last article of antenna 2 (Fig. 28L); female antenna 1 with minute first article (Fig. 28K); female pereopod 1 withouth spines on outer margin (Fig. 29E); both sexes having second article of endopod of uropod with six spines on inner margin (Fig. 30G).. ..... *C. nicoyensis*

- Male with three clasping teeth on the last article of antenna 2 (Fig. 10D); female antenna 1 with first article two times longer than wide (Fig. 12C); female pereopod 1 with 12 spines on outer margin (Fig. 13D); both sexes having second article of endopod of uropod with nine spines on inner margin (Figs. 11I, 13J) ..... *Coricuma* sp. nov. (Figs. 10A-B, 12A-B)

4(1) Mandible with truncate molar (Fig. 28O).....5

- Mandible with styliform molar (Fig 28P)……*Campylaspis*…….. [Females with only three pairs of exopods; maxilliped 2 with short dactylus and two or more spines terminally; carpus of maxilliped 3 not expanded; carapace with tubercles or tuberculate ridges (Fig. 27J); uropod with peduncle and endopod with many evenly-spaced medial setae (Fig. 30H)]…… ..... ..... *C. rubromaculata* ♀

5(4) Ocular elements separate in two groups. [Branchial siphons separate] ……..*Schizotrema* .....6

- Ocular elements fused in a single median lobe or absent .....7

6(5) Carapace with six spines on each lateral margin .....*Schizotrema* sp. nov. ♀ (Fig. 24A).

- Carapace with seven spines on each lateral margin.....*Schizotrema* sp. nov. ♂ (Figs. 22A-B)

7(5) Female without exopods…….*Elassocumella*.....8

- Female with at least two pairs of exopods. [Branchial siphons united medially; first article of antenna 1 without tubercle; peduncle of uropod as long as or longer than sixth pleonite] ……..*Cumella*.....9

8(7) Carapace with lateral ridges, peduncle of uropod with two distal spines on inner margin (Fig. 19G)..... *Elassocumella* sp. nov. ♂ (Figs. 18A-B)

- Carapace without lateral ridges; peduncle of uropod with two distal plumose setae on inner margin (Fig. 21F)..... *Elassocumella* sp. nov. ♀ (Figs. 20A-B)

9(7) Ocular lobe without lenses; pseudorostrum without antero-laterally cornea……. ……Subgenus *Cumella*……[Carapace with 4-5 strong teeth on dorsal surface; male peduncle of uropod with nine strong spines on inner margin; female with two short spines on inner margin (Fig. 30I)]..... *C.* (*Cumella*) *californica*

- Ocular lobe with lenses; pseudorostrum with antero-laterally cornea (Figs. 28 M-N)…….Subgenus *Cumewingia* .....10

10(9) Male peduncle of uropod with ten setulated spines on inner margin (Fig. 30K); female endopod of uropod with two setulated spines on inner margin (Fig. 30J)..... ..... *C.* (*Cumewingia*) *quintinensis* (Figs. 27K-L)

- Male peduncle of uropod with seven pinnate spines on inner margin (Fig. 15G); female endopod of uropod with six pinnate spines on inner margin (Fig. 17F)..... ..... *C.* (*Cumewingia*) sp. nov. (Figs. 14A-B, 16A)

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**TABLE 1**. Actual distribution for cumaceans from TEP provinces: A= Cortés; B= Mexican; C= Panamic; D= Galápagos; E= Disjunct; m= metres; ● = preview species record; ♦ = new species record.

| Species | Autor in ETP | A | B | C | D | E | Depth (m) |
|---|---|---|---|---|---|---|---|
| **Bodotriidae** | | | | | | | |
| *Cyclaspis bituberculata* Donath-Hernández, 1988 | Donath-Hernández, 1988 | ● | | | | | Littoral |
| *C. breedyae* Petrescu & Heard, 2004 | Petrescu & Heard, 2004 | | | ● | | | 1-1.5 |
| *C. concepcionensis* Donath-Hernández, 1988 | Donath-Hernández, 1988 | ● | | | | | Intertidal |
| | Petrescu *et al*. 2009 | | | ● | | ● | ? |
| *C. dolera* Zimmer, 1944 | Zimmer, 1944 | | | ● | | | 1-11 |
| | Jones, 1944* | | | ● | | | Intertidal |
| *C. nubila* Zimmer, 1936 | Donath-Hernández, 1987a | ● | | | | | 0-80 |
| *C. testudinum* Zimmer,1943a | Zimmer,1943a | | | ● | ● | | 49 |
| *C. vargasae* Petrescu & Heard, 2004 | Petrescu & Heard, 2004 | | | ● | | | 35 |
| *Cyclaspis* sp. C *sensu* Donath-Hernández | Petrescu *et al*. 2009 | | | ● | | | 0-20 |
| *Cyclaspis* sp. nov. 1 | | | ♦ | | | | 10 |
| *Cyclaspis* sp. nov. 2 | | | ♦ | | | | 3 |
| *Leptocuma forsmani* Zimmer, 1943a | Dexter, 1976 | ● | | | | | 1-2 |
| | Petrescu *et al*. 2009 | | | ● | | ● | ? |
| **Diastylidae** | | | | | | | |
| *Diastylis calderoni* Donath-Hernández, 1988 | Donath-Hernández, 1988 | ● | | | | | Littoral |
| *D. californica* Zimmer, 1936 | Petrescu & Heard, 2004 | | | ● | | ● | 18-123 |
| *D. tenebricosa* Jones, 1969 | Jones, 1969 | | | ● | | | 3,750 |
| *Leptostylis menziesi* Bacescu-Mester, 1967 | Bacescu-Mester, 1967 | | | ● | | | 1,892 |
| *Makrokylindrus americanus* Bacescu,1962 | Bacescu,1962 | | | ● | | | 1,748 |

| | | | | | | |
|---|---|---|---|---|---|---|
| *M. menziesi* Bacescu, 1962 | Bacescu, 1962 | | | | ● | 3469-3493 |
| | Petrescu *et al*. 2009 | | | ● | | ? |
| *Oxyurostylis pacifica* Zimmer,1936 | Donath-Hernández, 1987a | ● | | | | 10-100 |
| *O. tertia* Zimmer, 1943a | Donath-Hernández, 1987a | ● | | | | 4-17 |
| *Vemakylindrus costaricanus* (Bacescu, 1961) | Bacescu, 1961 | | | ● | | 3,718 |
| *V. gladiger* (Bacescu, 1961) | Bacescu, 1961 | | | ● | | 912 |
| **Leuconidae** | | | | | | |
| *Coricuma nicoyensis* Watling & Breedy, 1988 | Watling & Breedy, 1988 | | | ● | | Shallow |
| *Coricuma* sp. nov. | | | ♦ | | | Intertidal |
| *Leucon* (*Crymoleucon*) *bishopi* (Jones, 1969) | Jones,1969 | | | ● | | 915 |
| **Nannastacidae** | | | | | | |
| *Campylaspis rubromaculata* (Lie, 1969) | Donath-Hernández, 1987a | ● | | | | 22-23 |
| *Cumella* (*Cumella*) *californica* Watling & McCann, 1997 | Donath-Hernández (Pers. Com.) | ● | | | | 45-154 |
| *Cumella* (*Cumewingia*) sp. nov. | | | ♦ | | | 1-5 |
| *Cumella* (*Cumewingia*) *quintinensis* Donath-Hernández, 2011 | Donath-Hernández, 2011 | ● | | | | 0-50 |
| *Ellasocumella* sp. nov. | | | ♦ | | | 1-9 |
| *Schizotrema* sp. nov. | | | ♦ | | | 1.5 |
| **Total records** | | **10** | **6** | **17** | **2** | **3** |

*N.S. Jones in 1944 identified this species from Gorgona Island, Colombia according to the data base of Smithsonian National Museum of Natural History. Catalog number: USNM 109390.

**TABLE II.** Comparison between characters of *Cyclaspis* species recorded from Eastern Pacific. IM= inner margin; OM= outer margin; AP= apical.

| **Character** | ***Cyclaspis* sp. nov. 1** | ***Cyclaspis* sp. nov. 2** | ***C. bituberculata*** | ***C. breedyae*** | ***C. concepcionensis*** | ***C. dolera*** | ***C. giveni*** | ***C. nubila*** | ***C. peruana*** | ***C. testudinum*** | ***C. vargasae*** |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Sex | Female | Female | Female | Female | Female | Female | Female | Female | Female | Female | Female |
| Body length | 2.3 mm | 5.3 mm | 5.2 mm | 5 mm | 2.1 mm | 14 mm | 2.6 mm | 6 mm | 8.5 mm | 8 mm | 6 mm |
| Type locality | Copalita mouth river, Oaxaca | La Boquilla, Oaxaca | Bacochibampo bay, Sonora | Gulf of Nicoya, Costa Rica | Concepción bay, Baja California | Salinas bay, Costa Rica | Todos Santos bay, Baja California | Corona del Mar, California | Independencia bay, Perú | Chatam Island, Galápagos | Murciélago island, Costa Rica |
| Antenna 1- Main flagellum | Uniarticulated | Biarticulated | Biarticulated | Biarticulated | Biarticulated | ---- | Biarticulated | ---- | Biarticulated | Biarticulated | ---- |
| Antenna 1- first basal article inner margins | Small row of setulae medially and tree setae | 8 setulae | 2 setae apically | Bare | 1 medial seta and 2 setae apically | ---- | Bare | ---- | Small row of setulae medial-proximally | 3 setae medially | ---- |
| Spines on dorsal surface | Absent | 3 | Absent | 4 | Absent | 0-1 | Absent | Absent | ---- | Absent | Absent |
| Maxilliped 3- Inner margin basis | Not serrated | Not serrated | Not serrated | Serrated | Not serrated | ---- | Not serrated | ---- | ---- | ---- | Serrated |
| Maxilliped 3 - No. of setae on basis expansion | 3IM; 2AP; bare OM | 8IM; 2AP; 7 OM | 4IM; 2AP; 5OM | 3IM; 2AP; bare OM | 2IM; 2AP; bare OM | ---- | 3IM; 2AP; a row of setulae on OM | ---- | ---- | ---- | 12OM; 2AP; bare OM |
| Maxilliped 3 - Ornametation on merus expansion | 1 seta apically and a row of setulae on outer margin | Both margins with spines, with 1 strong spine | ---- | Both margins without spines | 1 small setae apically | ---- | 1 seta apically and a row of setulae on outer margin | ---- | ---- | ---- | Both margins with spines, with 4 strong spines |
| Pereopod 1- Basis outer margin | 1 row of setulated setae | 1 medial spine and 2 distal spines | 3 distal setae | Bare | 3 setae medial-distally | ---- | Bare | ---- | Bare | 3 setae medial-distally | At least 7 spines |
| Endopod of uropod-peduncle inner margin | Bare | 28 small spines | 5 spines | 14 small spines | Bare | 18 setae | Bare | Bare | Bare | About 21 small spines | 17 small spines |
| Endopod of uropod - Terminal seta | Fused | No fused | No fused | No fused | No fused | No fused | No fused | No fused | No fused | No fused | No fused |
| Endopod of uropod – inner margin | 2 distal spines | 20 small spines and seven pinnate spines | 7 spines | 4 spines | Serrated | 5 spines | 2 distal spines | 9 spines | 10 setae | 13 setae | Serrated, with 1 seta |

**TABLE III.** Comparison between characters of *Cumella* (*Cumewingia*) species recorded from coast of the American continent.

| **Character** | ***C.Cumewingia* sp. nov.** | ***C.C. anae*** | ***C.C. angelae*** | ***C.C. bacescui*** | ***C.C. caribbeana*** | ***C.C. clavicauda*** | ***C.C. quintinensis*** | ***C.C. leptopus*** | ***C.C. serrata*** | ***C.C. somersi*** |
|---|---|---|---|---|---|---|---|---|---|---|
| Type locality | Corralero laggon, Oaxaca | Andros Island, Bahamas | Andros Island, Bahamas | Andros Island, Bahamas | Tavernik Key, Florida | Cruz bay, Virgin Islands | San Quintín bay, Baja California | Cruz bay, Virgin Islands | Cruz bay, Virgin Islands | Devonshire bay, Bermuda |
| Carapace- Spines on dorsal surface | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent | 7 | 2 |
| Carapace- shape | Oviform and without elevation | Without elevation | Without elevation | Elavated and blunt | Oviform and without elevation | Without elevation | Oviform and without elevation | Blunt and without elevation | Pointed and without elevation | Without elevation |
| Carapace-dorsolateral ridges ♂ | Present | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent |
| Ocular lobes- pigments ♂ | Present | Present | Present | Present | Present | Present | Absent | Absent | Present | Present |
| Triangular elevation on first three pereonitos ♂ | Present | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent | Absent |
| Pereopod 2- Basis inner margin ♂ | Bare | ---- | ---- | ---- | 10 spines | 12 spines | Bare | ---- | Serrated hyaline crest | Small hyaline serration |
| Length uropod peduncle vs last pleonite | Longer | Shorter | Shorter | Longer | Shorter | Shorter | Longer | Longer | Longer | Longer |
| Uropod- length endopod vs exopod | Subequal | ---- | ---- | ---- | Longer | Longer | Longer | Longer | Longer | Longer |
| Uropod peduncle-inner margin ♂ | 7 pinnate spines | ---- | ---- | ---- | 6 spines | 3 spines | 10 spines | 9 spines | 6 spines | 5 setae and a row of setulae |
| Uropod peduncle-inner margin ♀ | Bare | ---- | ---- | ---- | 5 spines | 2 spines | 5-7 espines | ---- | 4 spines | 3 setae |
| Uropod-endopod inner margin ♂ | 7 pinnate spines | ---- | ---- | ---- | 5 spines | 1 spine 4 setulated setae | 5-6 spines | 6 spines | 6 spines | 6 setae and a row of setulae |
| Uropod-endopod inner margin ♀ | 6 pinnate espines | ---- | ---- | ---- | 2 spines | 1 spine and 3 setulated setae | 2 spines | ---- | 3 spines | 2 setae |

# APPENDIX

## I. Annotated checklist for cumaceans (Crustacea: Peracarida) from Eastern Tropical Pacific

**Notes:** The followings records exist into Gulf of California, however according to Donath-Hernández (pers. com.) actually doesn't exist any description or illustration for *Cumella* (*Cumella*) sp. 1, *Cyclaspis* sp. A, *Cyclaspis* 3, *Cyclaspis* 4, *Campylaspis* sp. A and *Campylaspis* sp. B. Also is the same case for *Cyclaspis* sp. A *sensu* Dexter, 1979 recorded from Panamá and Costa Rica.

**Superorder Peracarida**

**Order Cumacea**

**Family Bodotriidae Scott, 1901**

**Subfamily Bodotriinae Scott, 1901**

***Cyclapsis* Sars, 1865**

*Cyclaspis bituberculata* Donath-Hernández, 1988

*Cyclaspis bituberculata* Donath-Hernández, 1988: 538-542, fig. 5 (Type locality: Bacochibampo bay, 27°54'-27°57'N, 110°58'-111°06'W, coast of Guaymas, Sonora, México. Holotype ovigerous ♀, EM 6838; paratype ovigerous ♀, C. CUM 003).

**Geographic distribution:** West Coast of Baja California: Laguna Ojo de Libre; gulf of California: Bacochibampo bay (Sonora) and Concepción bay (Baja California).

**Habitat:** Found in sand, littoral.

**Taxonomic remarks:** According to Donath-Hernández (1988), *C. bituberculata* can be easily distinguished from any of the American species by a carapace with two antero-lateral tubercles and with the exception of *C.dolera* by an elongated and narrow ocular lobe.

*Cyclaspis breedyae* Petrescu & Heard, 2004

*Cyclaspis breedyae* Petrescu & Heard, 2004: 2- 5, fig. 1 (Type locality: Gulf of Nicoya, Costa Rica, beach 1–2 km north of Puerto Caldera. Holotype ♀, UCR 8383-01; paratype ♀, MGAB CUM 1447; paratype ♀, GCRL 2074). Petrescu *et al*. 2009: 237-244, CD-Rom Species List 18.2.

**Geographic distribution:** Only know for type locality.

**Habitat:** Found in sand, 1-1.5 m depth.

**Taxonomic remarks:** According to Petrescu & Heard (2004) *C. breedyae* has affinities with *Cyclaspis varians* Calman, 1912 from the Western Atlantic. Both have similar uropods, but the Costa Rican species differs by its carapace having a more strongly developed dorsal spines ("fine teeth" present in *C. varians*); having a distinct ridge, which is missing in the Atlantic species, running obliquely from mid dorsal region to the base of antennal notch; and having the pseudorostrum not

exceeding the ocular lobe. It further differs from *C. varians* by having the antenna 1 with the last peduncle article no longer than those preceding it, and pereopod 1 relatively longer with a shorter basis.

**Observations:** According to Petrescu & Heard (2004), some other sand dwelling crustaceans occurring in dredge net samples from the surf zone at Puerto Caldera with *C. breedyae* included the cumacean *L. forsmani*; the mysid *Bowmaniella banneri* Bacescu, 1968; the isopod *Ancinus panamensis* Glynn & Glynn, 1974; and the mole crab *Emerita rathbunae* Schmitt, 1935.

*Cyclaspis concepcionensis* Donath-Hernández, 1988

*Cyclaspis concepcionensis* Donath-Hernández, 1988: 535-539, figs. 3-4 (Type locality: Concepción bay, gulf of California, México. Holotype ovigerous ♀, EM 6837; alotype adult ♂ EM 6837-A; paratype ovigerous ♀, C. CUM 002). Brusca & Hendrickx, 2005: 154.

**Geographic distribution:** Gulf of California: Concepción bay; Costa Rica: Pacific coast.

**Habitat:** Found in sandy beaches, intertidal.

**Taxonomic remarks:** According to Donath-Hernández (1988), *C. concepcionensis* is similar to *Cyclaspis costata* Calman, 1904, *Cyclaspis strisilis* Hale, 1944 and *Cyclaspis bacescui* Omholt & Heard, 1982, because they have a shell with oblique streaks. However unlike the species *C. concepcionensis* presents the ischium of pereopod 1 with two distal projections, the inner margin of peduncle of uropod with 5-7 plumose setae and 6-8 spines, and the apex of endopod with two subequal spines with fine setae.

*Cyclaspis dolera* Zimmer, 1944

*Cyclaspis dolera* Zimmer, 1944: 129-132, fig. 21-26 (Type locality: Salinas bay, off end of island, Toward Rock To Western, pacific coast of Costa Rica. Holotype ♀, USNM 92027). Bacescu, 1988: 55; Petrescu *et al*. 2009: 237-244, CD-Rom Species List 18.2.

**Geographic distribution:** Only know for type locality.

**Habitat:** Gross sand, 1-11 m depth.

**Taxonomic remarks:** Zimmer (1944) provides an overview about the differences between genera *Cyclaspis* Sars, 1865 and *Iphinoe* Bate, 1856.

*Cyclaspis nubila* Zimmer, 1936

*Cyclaspis nubila* Zimmer, 1936: 424-427, fig. 34 (Type locality: Corona del Mar, Orange County, California, U.S.A. Holotype adult ♀, USNM 71437). Gladfelter, 1975: 242; Donath-Hernández, 1987a: 71; Brusca & Hendrickx, 2005: 157.

**Geographic distribution:** California: Point Conception to San Diego, U.S.A.; West Coast of Baja California: Todos Santos bay and El Sauzal; gulf of California: Bahía de los Ángeles and Rasa island.

**Habitat:** Found in sand, kelp beds, silt bottoms, sand pool, and rocky beaches; intermareal to 80 m depth.

**Taxonomic remarks:** According to Zimmer (1936), *C. nubila* is distinguished to *Cyclaspis levis* Thomson, 1892 by the fact that the endopods of the uropods is not pointed, but armed with a terminal spine. In *Cyclaspis picta* Calman, 1904, and *C. varians* the pseudorsotral lobes distinctly unite in advance of the ocular lobe to form a pseudorostrum; and shows distinct ridges on the caparace.

**Observations:** According to Donath-Hernández (pers. obs.) *C. nubila* is fed by scraping and brushing sand grains and apparently also as a filter.

*Cyclaspis testudinum* Zimmer, 1943a

*Cyclaspis testudinum* Zimmer, 1943a: 143-146, figs. 18-23 (Type locality: San Cristobal Island, Chatham Island, Galápagos Islands. Holotype ♀, USNM 92022). Bacescu, 1988: 68.

**Geographic distribution:** Galápagos Islands; Colombia: Gorgona Island.

**Habitat:** 49 m depth.

**Taxonomic remarks:** According to Zimmer (1943a), *C. testudinum* and *Cyclapsis goesi* Sars, 1871, a West Indian species, have very close relationships with each other because both have the same last and keel formations and the same dimple on the top and because have stronger bars on the abdomen and on her keel in the middle frontal lobe a tooth-shaped elevation.

*Cyclaspis vargasae* Petrescu & Heard, 2004

*Cyclaspis vargasae* Petrescu & Heard, 2004: 5-8, figs. 2-3 (Type locality: NW coast of Costa Rica, Station 8, off San José Island, Isla Murciélago. Holotype subadult ♀, UCRZM 2382-02; paratype ♂, UCR 8382-01; paratype ♀, MGAB CUM 1448). Petrescu *et al*. 2009: 237-244, CD-Rom Species List 18.2.

**Geographic distribution:** Only know for type locality.

**Habitat:** Found in fine sand-silt, 35 m depth.

**Taxonomic remarks:** According to Petrescu & Heard (2004), *C. vargasae* has some similarities with *Cyclaspis alba* Roccatagliata & Moreira, 1986 and *Cyclaspis variabilis* Roccatagliata & Moreira, 1986, which are both known from the Western Atlantic. It differs from these two species by having a carapace with oblique dorsal crests, a lateral ridge running anteriorly from the posteroventral margin of the carapace to end just above the antennal notch, and a uropod with fewer setae on the endopod.

**Observations:** According to Petrescu & Heard (2004) *C. vargasae* co-occurred with a diverse group of invertebrates, including mollusks, polychaetes, and a variety of crustaceans including tanaidaceans (*Leptochelia* sp.), amphipods, brachyuran crabs, caridean shrimps, and the diastylid cumacean, *D. californica*.

*Cyclaspis* c sensu Donath-Hernández, 1985

*Cyclaspis* sp. C sensu Given, 1970: 52, figs. 10-13; Donath-Hernández, 1985: 47-48; SCAMIT, 1986 vol. 4 No. 12, code: HYP 54; Petrescu *et al*. 2009: 237-244, CD-Rom Species List 18.2.

**Geographic distribution:** South of California: Point Arguello and Santa Cruz Island to San Diego, U.S.A.; West Coast of Baja California: Todos Santos bay, El Sauzal and Punta Cono; Costa Rica: Pacific coast.

**Habitat:** Found in sand, sand-silt or sediments within kelp beds; intertidal, 0-20 m depth.

**Observations:** Petrescu *et al*. 2009 indicate that *Cyclaspis* sp. C from Costa Rica is currently being described by Donath-Hernández based upon material from the Mexican Pacific coast. So in the unique work of Donath-Hernández mentioned *Cyclaspis* c was in his own master thesis (Donath-Hernández, 1985). At the same time Donath- Hernández (1985) mentioned that this species is similar to *Cyclaspis* c Given (1970), also a post degree thesis, for California, U.S.A.

*Cyclaspis* sp. nov. 1

*Cyclaspis* sp. nov. 1 (Type locality: Copalita mouth river, Huatulco, Oaxaca, 15°46'57.4284''N, 96°2'44.5668''W, 10 m depth. Holotype ovigerous ♀, UMAR-PERA-488).

**Geographic distribution:** Only know for type locality.

**Habitat:** Found in sand.

*Cyclaspis* sp. nov. 2

*Cyclaspis* sp. nov. 2 (Type locality: La Boquilla bay, Puerto Ángel, Oaxaca, 15°40'55.743''N, 96°27'54.0576''W, Mexican South Pacific, 3 m depth. Holotype adult ♂, UMAR-PERA-490).

**Geographic distribution:** Only know for type locality.

**Habitat:** Found in sand.

**SubFamily Vaunthompsoniinae G.O. Sars, 1878**

**Genus *Leptocuma* Sars, 1873**

*Leptocuma forsmani* Zimmer, 1943a

*Leptocuma forsmani* Zimmer, 1943a: 147-150, figs. 24-28 (Type locality: Station 2835, steamer Albatross, 26°42'30''N, 113°34'15''W, West Coast of Baja California; 10 m depth. Holotype unknown location). Jones, 1969: 155; Dexter, 1976: 479-485; Donath-Hernández, 1987b: 35-52; Bacescu, 1988: 116-117; Brusca & Hendrickx, 2005: 154; Petrescu *et al*. 2009: 237-244, CD-Rom Species List 18.2.

**Geographic distribution:** California: Santa Barbara, U.S.A.; West Coast of Baja California: Rosarita beach and Todos Santos bay; gulf of California: Laguna Percebú and Punta Estrella, San Felipe, Baja California, and Puerto Peñasco and Guaymas, Sonora; Costa Rica: pacific coast.

**Habitat:** Found in sand, 2-10 m depth.

**Family Diastylidae Bate, 1856**

**Genus *Diastylis* Say, 1818**

*Diastylis calderoni* Donath-Hernández, 1988

*Diastylis calderoni* Donath-Hernández, 1988: 531-535, fig. 2 (Type locality: Estero de Morua, Puerto Peñasco, Sonora, 31°17'N–113°26'W. Holotype adult ♀, EM 6839; paratype: adult ♀ C.CUM 001).

**Geographic distribution:** Only know for type locality.

**Habitat:** Littoral.

**Taxonomic remarks:** According to Donath-Hernández (1988), *D. calderoni* resembles *Diastylis planifrons* Calman, 1912 (Magellan Strait) but it differs by a carapace with a strong tooth on the antero-lateral angle and the absence of a mid-dorsal ridge. The morphology of the third maxilliped is distinct, the pereopod 2 has a longer carpus and the endopod of uropod longer than the exopod. Four other species clearly distinguishable from *D. calderoni* but found near México are: *Diastylis abboti* Gladfelter, 1975, *Diastylis californica* Zimmer, 1936, *Diastylis paraspinulosa* Zimmer, 1926 and *Diastylis pellucida* Hart, 1931. All of them differ to the new species by a carapace distinctly sculptured and the absence of the lateral tooth. The proportion between the telsonic somite and the telson is subequally similar in *D. calderoni* and *D. abboti*, and equal in *D. californica*. Among the five species, *D. pellucid* has the longer telson and endopod of uropod biarticulated.

*Diastylis californica* Zimmer, 1936

*Diastylis californica* Zimmer, 1936: 431-435, fig. 37 (Type locality: Between Balboa and Corona del Mar, California, U.S.A.; 18-123 m depth. Holotype ♀, USNM 71440). Bacescu, 1992: 282; Watling & McCann, 1997: 135, fig. 2.9; Petrescu *et al*. 2009: CD-Rom Species List 18.2.

**Geographic distribution:** California: Off southern coast, San Diego to Point Conception, U.S.A.; Costa Rica: pacific coast.

**Habitat:** 18-123 m depth.

**Taxonomic remarks:** According to Zimmer (1936), the peculiar sculpturing of the carapace in both sexes distinguishes this new species from all other representatives of the family.

?*Diastylis tenebricosa* Jones, 1969

*Makrokylindrus* n. sp. Wolff, 1961: 144, fig. 11.

*?Diastylis tenebricosa* Jones, 1969: 130-131, fig. 15 (Type locatily: Galathea St. 716, Acapulco-Panamá, 9°23'N - 89°32'W; 3 570 m depth. Holotype ♀, UZMK). Bacescu, 1992: 316; Petrescu *et al*. 2009: CD-Rom Species List 18.2.

**Geographic distribution:** Central America: near to Panamá; Costa Rica: Pacific coast.

**Habitat:** Found in muddish clay, 3 570 m depth.

**Taxonomic remarks:** According to Jones (1969), the absence of the abdomen makes it impossible to assign this species with certainty to a genus and it is referred only tentatively to *Diastylis*. However, it does not obviously fit elsewhere. No other described species in the order has similar markings on the carapace and further specimens should be recognized without difficulty when they become available.

**Genus *Leptostylis* G.O. Sars, 1869**

*Leptostylis menziesi* Bacescu-Mester, 1967

*Leptostylis menziesi* Bacescu-Mester, 1967: 268-270, fig. 3 (Type locality: Station V-15-60 from Vema Expedition, 6°21'N, 85°17'W, Pacific ocean, Western of Panamá; 1892 m depth. Holotype ♂, MGAB 80).

**Geographic distribution:** Only know for type locality.

**Habitat:** 1 892 m depth

**Genus Makrokylindrus Stebbing, 1912**

*Makrokylindrus americanus* Bacescu, 1962

*Makrokylindrus* (*Adiastylis*) *americanus* Bacescu, 1992: 354.

*Makrokylindrus americanus* Bacescu, 1962: 213-216, fig. 4 (Type locality: Station 122, L.G.O., Pacific ocean, Western tropical America, 7°25'N, 79°23'W; 1748 m depth. Holotype ♂ juv., MGAB).

**Geographic distribution:** Only know for type locality.

**Habitat:** 1748 m depth.

**Observations:** According To Bacescu (1992), this was the second species of *Makrokylindrus* recorded in the waters off the Americas, as well as the eastern Pacific.

*Makrokylindrus menziesi* Bacescu, 1962

*Makrokylindrus menziesi* Bacescu, 1962: 215-217, figs. 5-6 (Type locality: Station 137, L.G.O., near to Galápagos Islands, 09°20.5'N, 89°34'W; 3469-3493 m depth. Holotype ♂, MGAB). Petrescu *et al*. 2009: CD-Rom Species List 18.2.

*Makrokylindrus* (*Adiastylis*) *menziesi* Bacescu, 1992: 362.

**Geographic distribution:** Central America: South of El Salvador to west of Costa Rica; Galápagos Islands.

**Habitat:** 3 469-3493 m depth.

**Taxonomic remarks:** According to Bacescu (1962), *M. menziesi* differs to *Makrokylindrus fistularis* Calman, 1911, because *M. menziesi* has a rough shell while *M. fistularis* is smooth and striated longitudinally, and the uropods longer than the telson.

**Observation**: According to Bacescu (1962), *M. menziesi* was captured in the company of *Eudorella* sp., another cumacea

**Genus *Oxyurostylis* Calman 1912**

*Oxyurostylis pacifica* Zimmer, 1936

*Oxyurostylis pacifica* Zimmer, 1936: 437-438, fig. 39 (Type locality: Between Balboa and Corona del Mar, California; 12-27 m depth. Holotype ♀, USNM 71442). Zimmer, 1943a: 164-166: figs. 55-58; Donath-Hernández, 1987a: 71-73; Bacescu, 1992: 366-367.

**Geographic distribution:** California: Orange County, U.S.A.; West Coast of Baja California: Todos Santos bay and San Quintín bay (between Ballenas bay and Punta Pequeña); gulf of California: Bahía de los Ángeles.

**Habitat:** Found in sand silt bottoms, 10-100 m depth.

**Taxonomic remarks:** According to Zimmer (1936), *O. pacifica* differs so fundamentally from *Oxyurostylis smithi* Calman, 1912, because this previous species was the unique representative species of the genus, that there is no possibility of confusing the two.

**Observations:** According to Zimmer (1936) can occur with *Campylaspis canaliculata* Zimmer, 1936, another cumacean.

*Oxyurostylis tertia* Zimmer, 1943a

*Oxyurostylis tertia* Zimmer, 1943a: 167-169, figs. 59-61 (Type locality: Station 2835, streamer Albatross, 26°42'30''N, 113°34'15''W, West coast of Baja California, México; 10 m depth. Holotype ♀, USNM 92019). Donath-Hernández, 1987a: 73; Bacescu, 1992: 368.

**Geographic distribution:** West Coast of Baja California: Type locality and San Quintín bay; gulf of California: Bahía de los Ángeles, in front of Percebú lagoon.

**Habitat:** Found in sand and muddy substratum, 4-17 m depth.

**Genus *Vemakylindrus* Bacescu, 1961**

*Vemakylindrus costaricanus* (Bacescu, 1961)

*Vemakylindrus costaricanus* Bacescu, 1992: 372.

*Makrokylinkus* (*Vemakylindrus*) *costaricanus* Bacescu, 1961: 325-329, figs. 1-2 (Type locality: Station 133, L.G.O., S-O Costa Rica, 10°07'N, 89°50'W; 3718 m depth. Holotype ♀, MGAB 42). Jones, 1969: 170; Day, 1980: 239; Petrescu *et al*. 2009: CD-Rom Species List 18.2.

**Geographic distribution:** Only know for type locality.

**Habitat:** 3718 m depth.

**Taxonomic remarks:** According To Bacescu (1961), the integument of *V. costaricanus*, its appendages and telson especially, are particularly friable thorns and tubers are also brittle and void.

**Observations**: According to Bacescu (1961), *V. costaricanus* was captured with barnacle *Neopilina galatheae* Lemche, 1957, in the abyssal waters of the Pacific, west of Costa Rica. Also lives in a rich combination of amphipods, polychaetes, bivalves and especially with tanaids *Apseudes* Leach, 1814.

*Vemakylindrus gladiger* (Bacescu, 1961)

*Makrokylindrus* (*Vemakylindrus*) *gladiger* Bacescu, 1961: 329-331, fig. 3 (Type locality: Station 107, L.G.O., Colombian Pacific Coast, 09°46'3''N, 19°37'5''W; 912 m depth. Holotype ♀, MGAB 41). Jones, 1969: 169; Day, 1980: 238.

**Geographic distribution:** Only know for type locality.

**Habitat:** 912 m depth.

**Family Leuconidae Sars, 1878**

**Genus *Coricuma* Watling & Breedy, 1988**

*Coricuma nicoyensis* Watling & Breedy, 1988

*Coricuma nicoyensis* Watling & Breedy, 1988: 527-533, figs. 1-4 (Type locality: Upper part of tidal flat near Punta Morales, Costa Rica, 10°04'N, 84°58'W. Holotype♀, USNM 241875; paratypes USNM 241876, UCR-PM 038). Watling, 1991a: 576; Petrescu *et al*. 2009: CD-Rom Species List 18.2.

**Geographic distribution:** Only know for type locality.

**Habitat:** Found in fine sand and muddy, shallow water.

**Observations:** Previously regarded as a member of the family Bodotriidae, however Watling (1991) relocated the genus within the family Leuconidae.

*Coricuma* sp. nov.

*Coricuma* sp. nov. (Type locality: Ventura beach, Arriaga, Chiapas 16°05'41.8''N, 93°58'51.9''W, intertidal. Holotype adult ♂, UMAR-PERA-492).

**Habitat:** Found in mud sediment.

**Observations:** This is the second species record of genus *Coricuma* for the Eastern Pacific.

**Genus *Leucon* Krøyer, 1846**

*Leucon* (*Crymoleucon*) *bishopi* (Jones, 1969)

*Leucon* (*Epileucon*) *bishopi* Bacescu 1988: 168.

*Leucon* (*Crymoleucon*) *bishopi* Watling, 1991: 573.

*Epileucon pacifica* Jones, 1969: 115-117, fig. 8 (Type locality: Gulf of Panamá, 7°15'N, 79°25'W; 915 m depth. Holotype ♀, UZMK). Bishop, 1981: 403.

**Geographic distribution:** Only know for type locality.

**Habitat:** Found in green clay, 915 m depth.

**Observations:** Due to the incorrect location generic of *Epileucon pacifica* Jones, 1969; Bacescu (1988) removed this species into the genus *Leucon*, but this name was pre-occupied por *Leucon pacifica* Zimmer, 1937 (with type locality in Russia); so Bacescu (1988) had to propose the new and

actual name for this species, *Leucon* (*Crymoleucon*) *bishopi* (Jones, 1969). Additionally in the literature this species has had wrongly named.

**Family Nannastacidae Bate, 1866**

**Genus *Campylaspis* Sars, 1865**

*Campylaspis rubromaculata* (Lie, 1969)

*Campylaspis nodolosa* Lie, 1969: 27-29, fig. 4 (Type locality: Puget Sound, Seattle, Washington, U.S.A., station 1, 23 m depth. Holotype ♀, USNM 125081; paratypes, USNM 125082-125083). Lie, 1971: 33; Dexter, 1983: 10; Donath-Hernández, 1987a: 73-74; Bacescu, 1988: 202.

**Geographic distribution:** North American Pacific: Puget Sound (Washington) and California, U.S.A.; gulf of California: Bahía de los Ángeles, México.

**Habitat:** 22-23 m depth.

**Observations:** According to Lie (1971), Sars (1887) previously described *Campylaspis nodulosa*, from Karguelen (Desolation Island, Indo-Pacific); so he had proposed *Campylaspis rubromaculata* as a new name for *C. nodulosa* described by Lie (1969).

**Genus *Cumella* Sars, 1865**

*Cumella* (*Cumella*) *californica* Watling & McCann, 1997

*Cumella* (*Cumella*) *californica* Watling & McCann, 1997: 175-176, fig. 2.33 (Type locality: Santa Maria Basin, off Purisima Point, Station R-4, California, 34°43.01'N, 120°47.39'W; 92 m depth. Holotype USNM 273540; paratype USNM 273541 and LACM 95-70.1).

**Geographic distribution:** North American Pacific: Santa Maria Basin Region and off Point Loma, San Diego, California, U.S.A.; gulf of California: Bahía de los Ángeles, México.

**Habitat:** Benthic sediment, 45-154 m.

**Taxonomic remarks:** According to Watling & McCann (1997), in addition to the new species described on their paper, three *Cumella* (*Cumella*) species are known to have coarse spines along the middorsal crest of the carapace, *Cumella* (*Cumella*) *arguta* Gamo, 1962, *Cumella* (*Cumella*) *meridionalis* Jones, 1984, and *Cumella* (*Cumella*) *quadrispinosa* Gamo, 1965. None have the broadly flaring pleurites nor the short uropod peduncles seen in *C.* (*C.*) *californica*.

**Observations:** According to Donath-Hernández (pers. com.) *C.* (*C.*) *california* also occurs in Bahia de los Ángeles, gulf of California.

*Cumella* (*Cumewingia*) sp. nov.

*Cumella* (*Cumewingia*) sp. nov. (Type locality: Corralero lagoon, Pinotepa Nacional, Oaxaca 16°14'11.2668''N, 98°11'22.7544''W, 1 m depth. Holotype adult ♂, (UMAR-PERA-494).

**Geographic distribution:** Mexican South Pacific: from Coral beach, Ixtapa island, Guerrero to La Tijera beach, Pochutla, Oaxaca.

**Habitat:** Found in sand, coral rocks, algae; 1-5 m depth.

*Cumella* (*Cumewingia*) *quintinensis* Donath-Hernández, 2011

*Cumella* (*Cumewingia*) *quintinensis* Donath-Hernández, 2011: 41-46, figs. 1-2 (Type locality: San Quintín bay, Baja California, México, station 2; 20 m depth. Holotype adult ♂, EM-9914; paratypes ovigerous ♀, EM-9926).

**Geographic distribution:** West Coast of Baja California: San Quintín bay; gulf of California: Bahía de los Ángeles.

**Habitat:** Found from the sandy intertidal to waters no deeper than 50 m.

**Observations:** According to Donath-Hernández (2011), for the gulf of California, *C*. (*C*.) *quintinensis* was identified as *Cumella* sp. B by Donath-Hernández (1993). Also mentions that in the material examined from San Quintín bay two other species of cumaceans, *O*. *pacifica* and *O*. *tertia*, were also found.

**Genus *Elassocumella* Watling, 1991b**

*Elassocumella* sp. nov.

*Elassocumella* sp. nov. (Type locality: Mazunte, Tonameca, Oaxaca, 15°39'45.1404''N, 96°33'11.5734''W, 9.14 m. Holotype adult ♂, (UMAR-PERA-503).

**Geographic distribution:** Mexican South Pacific: from Coral beach, Ixtapa island, Guerrero to Maguey bay, Huatulco, Oaxaca.

**Habitat:** Found in sand, algae, sabellarid's colonies, epibiont of bivalves, coral rock, and anemones; 1-9.14 m depth.

**Observations:** This is the first record of genus *Elassocumella* Watling, 1991 for the entire Eastern Pacific coast and the second species described at mundial level.

**Genus *Schizotrema* Calman, 1911**

*Schizotrema* sp. nov.

*Schizotrema* sp. nov. (Type locality: San Agustín bay, Huatulco, Oaxaca, 15°41'12.1482''N, 96°13' 58.929''W, 1.5 m. Holotype adult ♂, (UMAR-PERA-519).

**Geographic distribution:** Mexican South Pacific: Coral beach, Ixtapa island, Guerrero and San Agustín bay, Huatulco, Oaxaca.

**Habitat:** Found in coral.

**Observations:** This is the first record of genus *Schizotrema* Calman, 1911 for the entire Eastern Pacific coast.

## II. Credits of the figures used in the illustrated key

Figures 26A,B, 28Q, 29H, 30E Zimmer, 1943a

Figures 26C,I, 27F, 28C,D,H, 29A,I,N-Q, 30F Donath-Hernández, 1988

Figures 26D, 28B,J, 29B-C,J,L-M Petrescu & Heard, 2004

Figure 26G (sensu Donath-Hernández, 1985)

Figure 26H SCAMIT, 1986.

Figures 26J, 27E,G, 28I, 29R, 30D Zimmer, 1936

Figures 26K, 30A Bacescu-Mester, 1967

Figures 27A,B, 28E,F, 30B-C (Bacescu, 1961)

Figures 27C,D, 28G, 29F-G Bacescu, 1962

Figure 27H Jones, 1969

Figure 27I Bacescu, 1988

Figures 27J, 30H (Lie, 1969)

Figures 27K-L, 28M,N, 30J-K Donath-Hernández, 2011

Figures 28A, 29D,K Zimmer, 1944

Figures 28K-L, 29E, 30G Watling & Breedy 1988

Figures 28O-P Heard *et al*. 2007

Figure 30I Watling & McCann, 1997

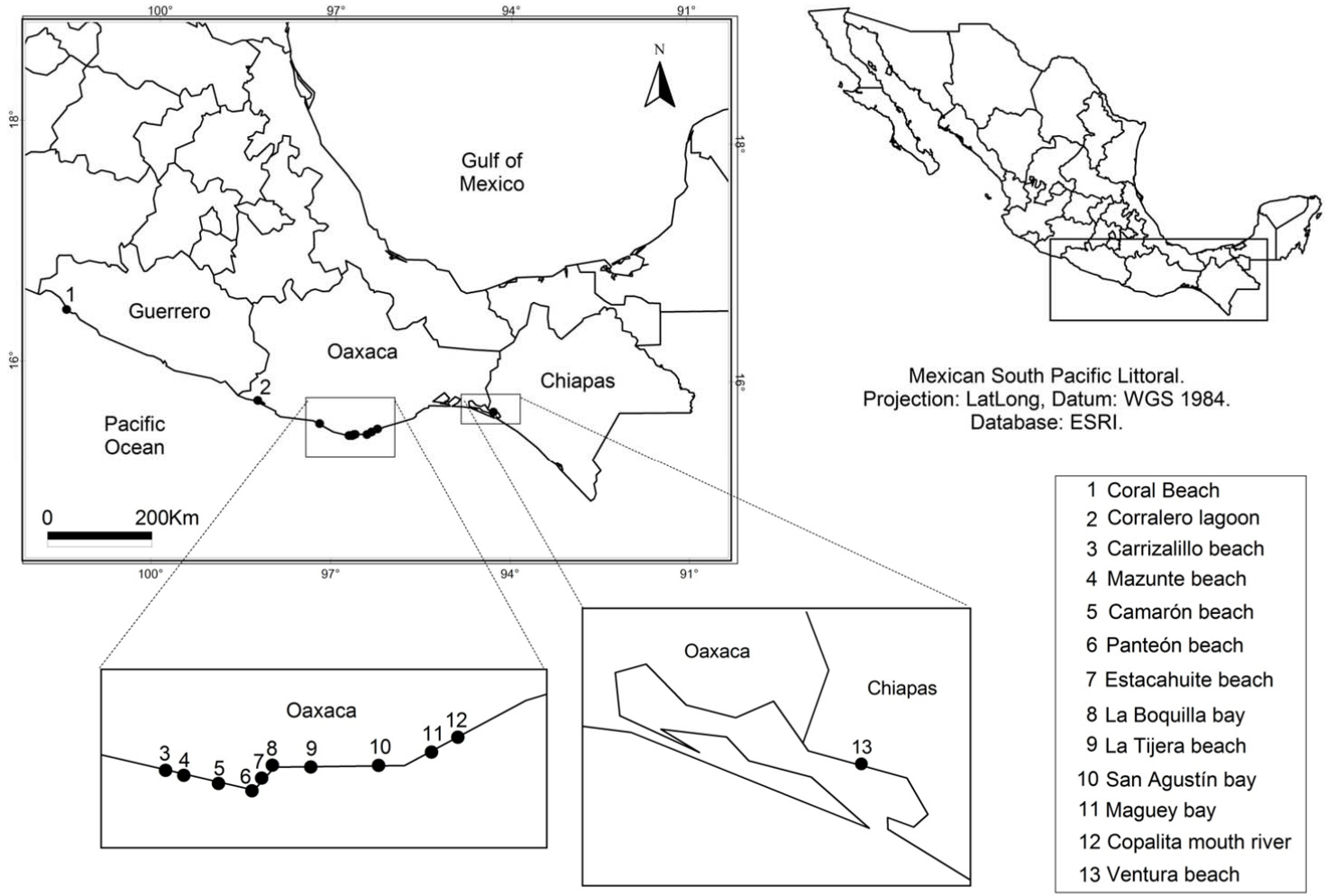


**FIGURE 1.** Distribution of localities belonging to the Mexican South Pacific, where cumaceans were collected.

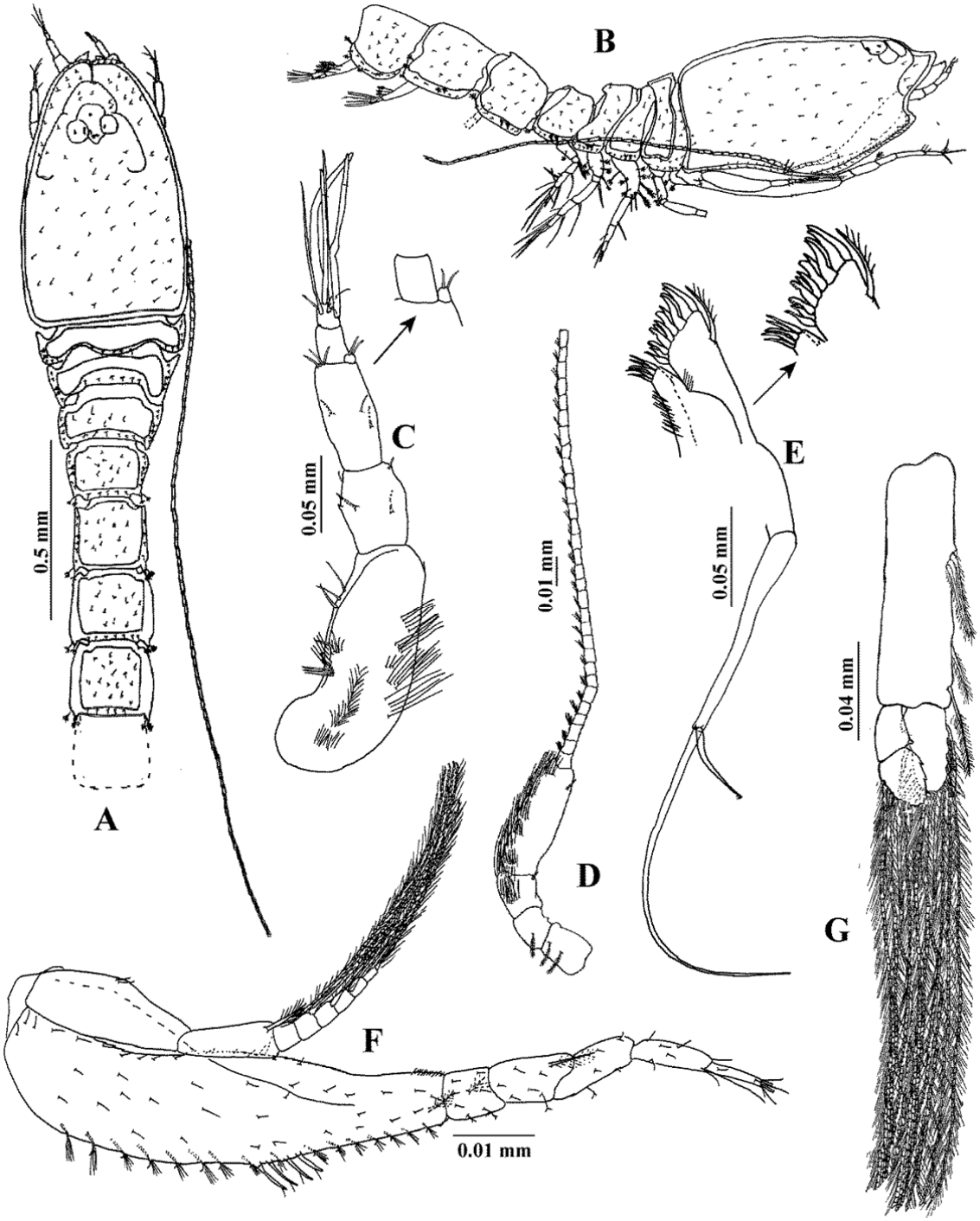


**FIGURE 2**. *Cyclaspis* sp. nov. 1, paratype, adult male, 2.1 mm, UMAR-PERA-489 Copalita mouth river, Huatulco, Oaxaca: A) dorsal view; B) lateral view; C) antenna 1; D) antenna 2; E) maxillule; F) pereopod 1; G) pleopod 2.

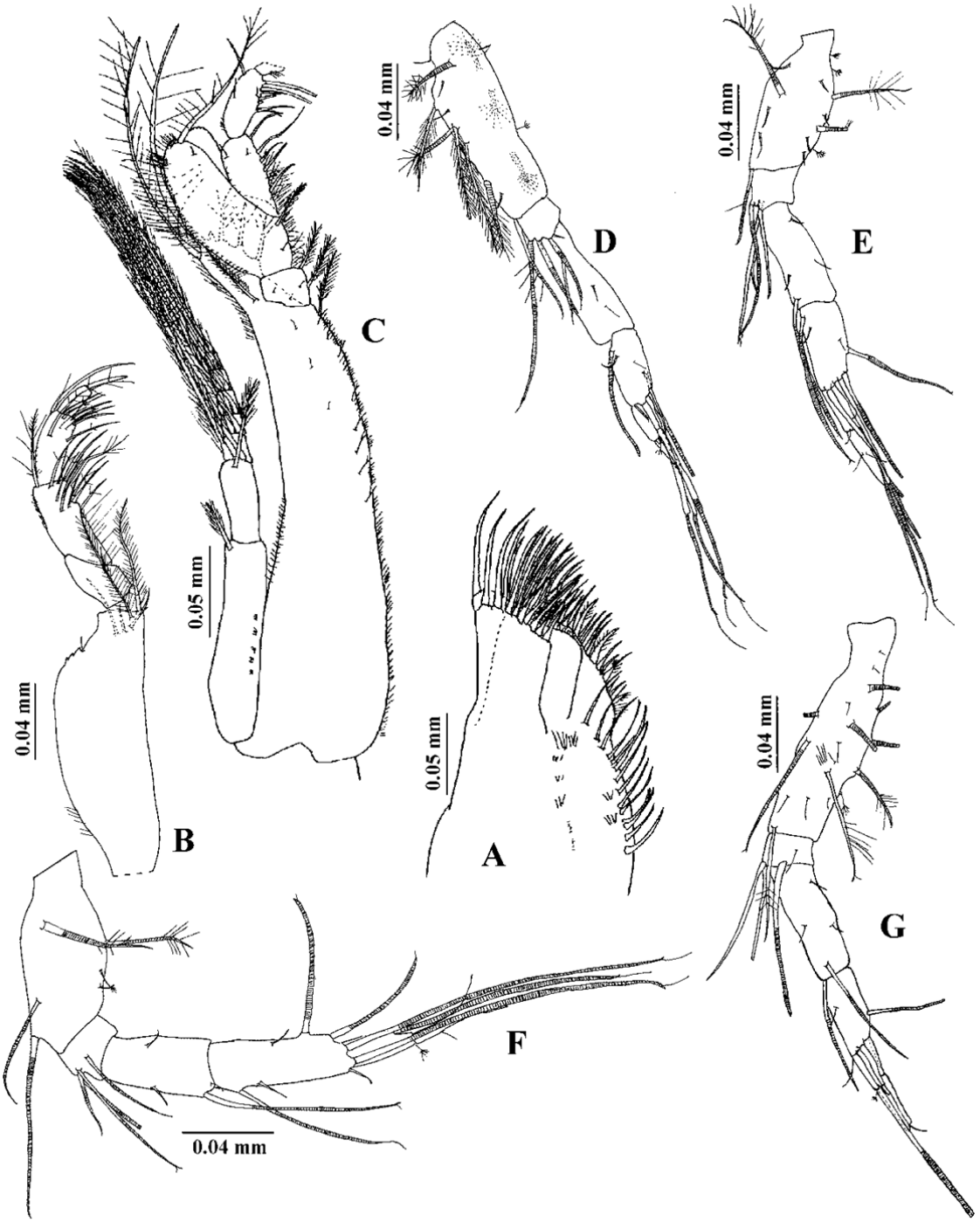


**FIGURE 3**. *Cyclaspis* sp. nov. 1, paratype, adult male, 2.1 mm, UMAR-PERA-489, Copalita mouth river, Huatulco, Oaxaca: A) maxilliped 3; B) maxilliped 2; C) maxilla; D) pereopod 2; E) pereopod 3; F) pereopod 4; G) pereopod 5.

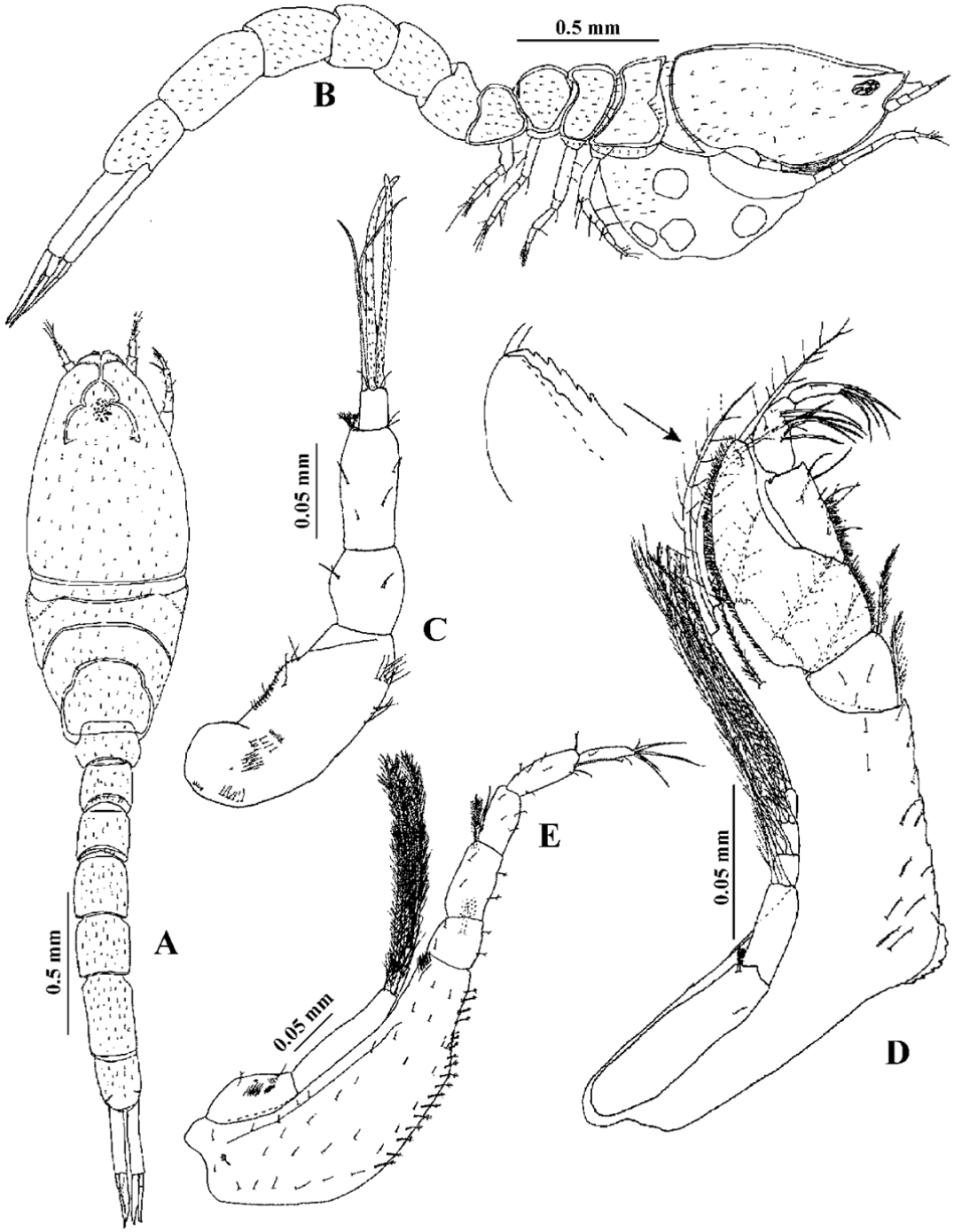


**FIGURE 4**. *Cyclaspis* sp. nov. 1, paratype, ovigerous female, 2.5 mm, UMAR-PERA-489, Copalita mouth river, Huatulco, Oaxaca: A) dorsal view; B) lateral view; C) antenna 1; D) maxilliped 3; E) pereopod 1.

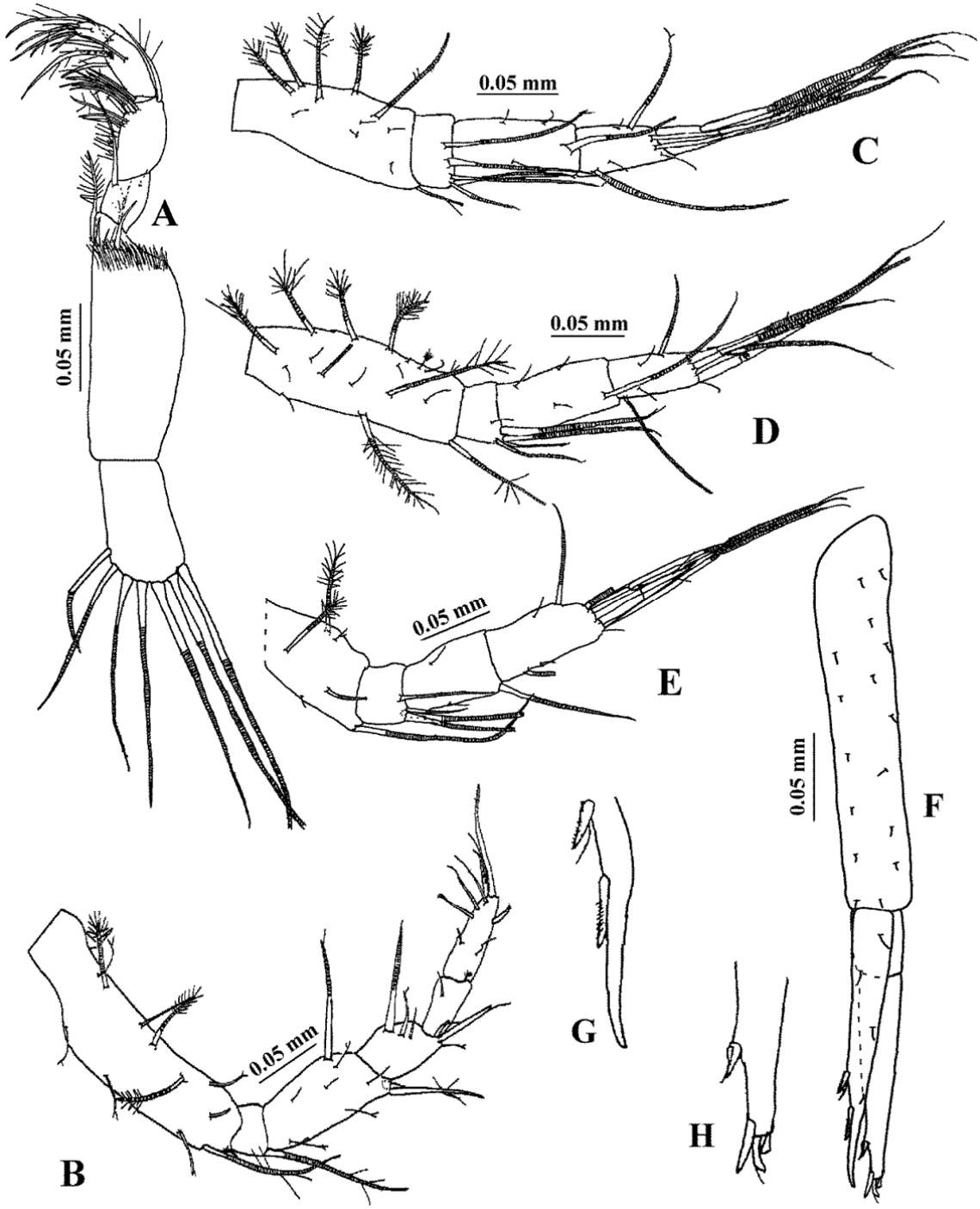


**FIGURE 5**. *Cyclaspis* sp. nov. 1, paratype, ovigerous female, 2.5 mm, UMAR-PERA-489, Copalita mouth river, Huatulco, Oaxaca: A) maxilliped 2; B) pereopod 2; C) pereopod 3; D) pereopod 4; E) pereopod 5; F) uropod; G) detail of endopod of uropod; H) detail of exopod of uropod.

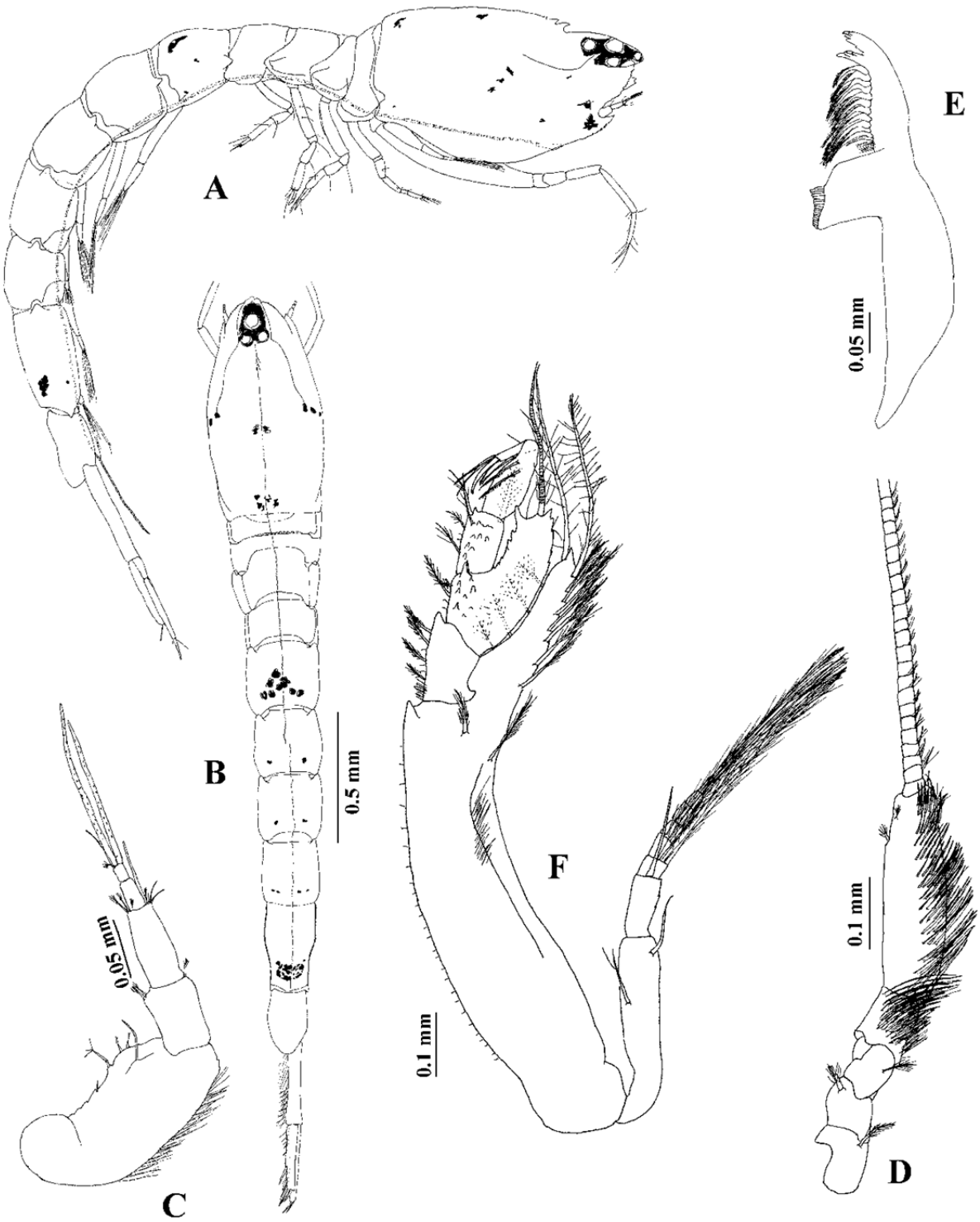


**FIGURE 6**. *Cyclaspis* sp. nov. 2, paratype, adult male, 6 mm, (UMAR-PERA-491), La Boquilla bay, Puerto Ángel, Oaxaca: A) lateral view; B) dorsal view; C) antenna 1; D) antenna 2; E) mandible; F) maxilliped 3.

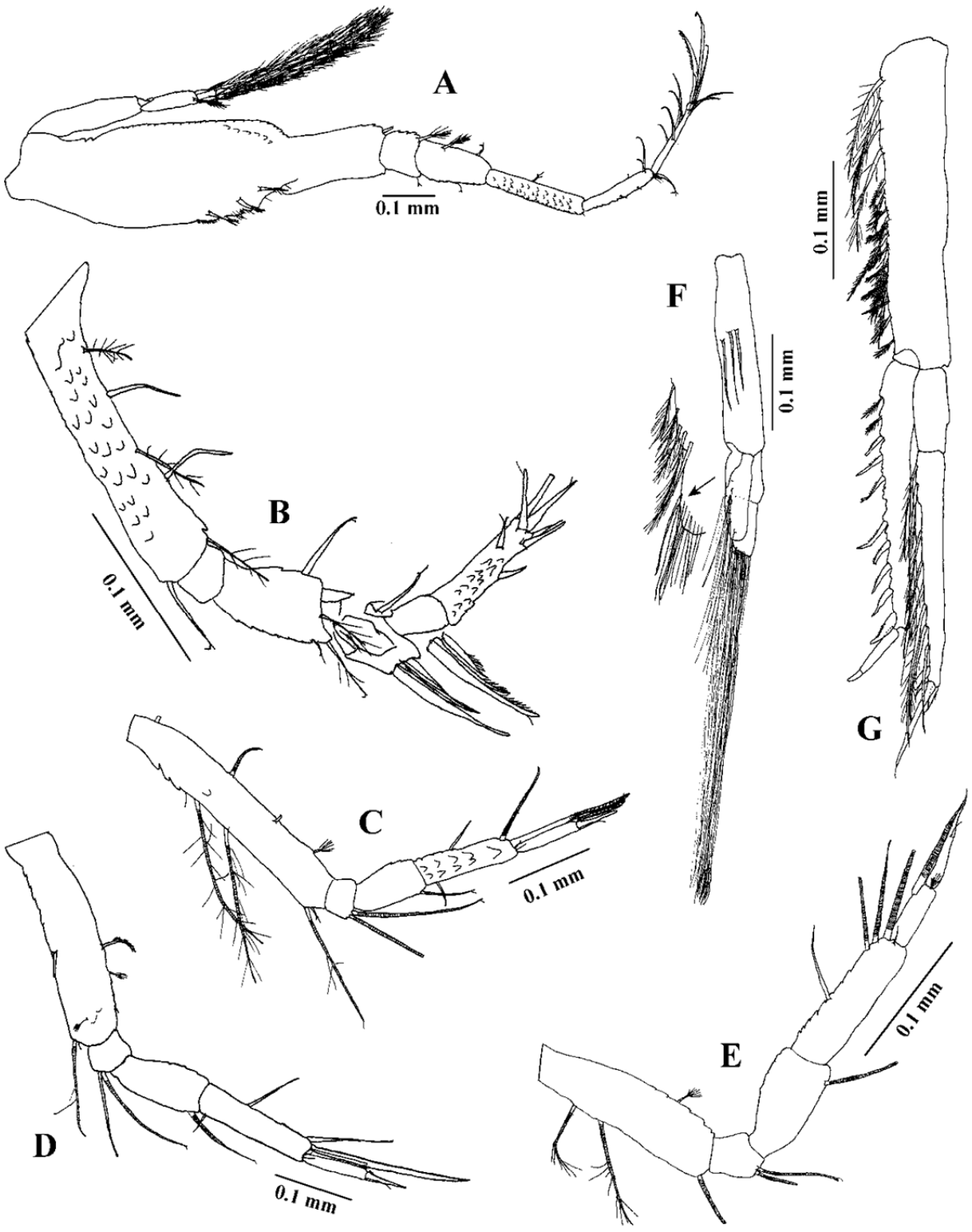


**FIGURE 7**. *Cyclaspis* sp. nov. 2, paratype, adult male, 6 mm, (UMAR-PERA-491), La Boquilla bay, Puerto Ángel, Oaxaca: A) pereopod 1; B) pereopod 2; C) pereopod 3; D) pereopod 4; E) pereopod 5; F) pleopod 2; G) uropod.

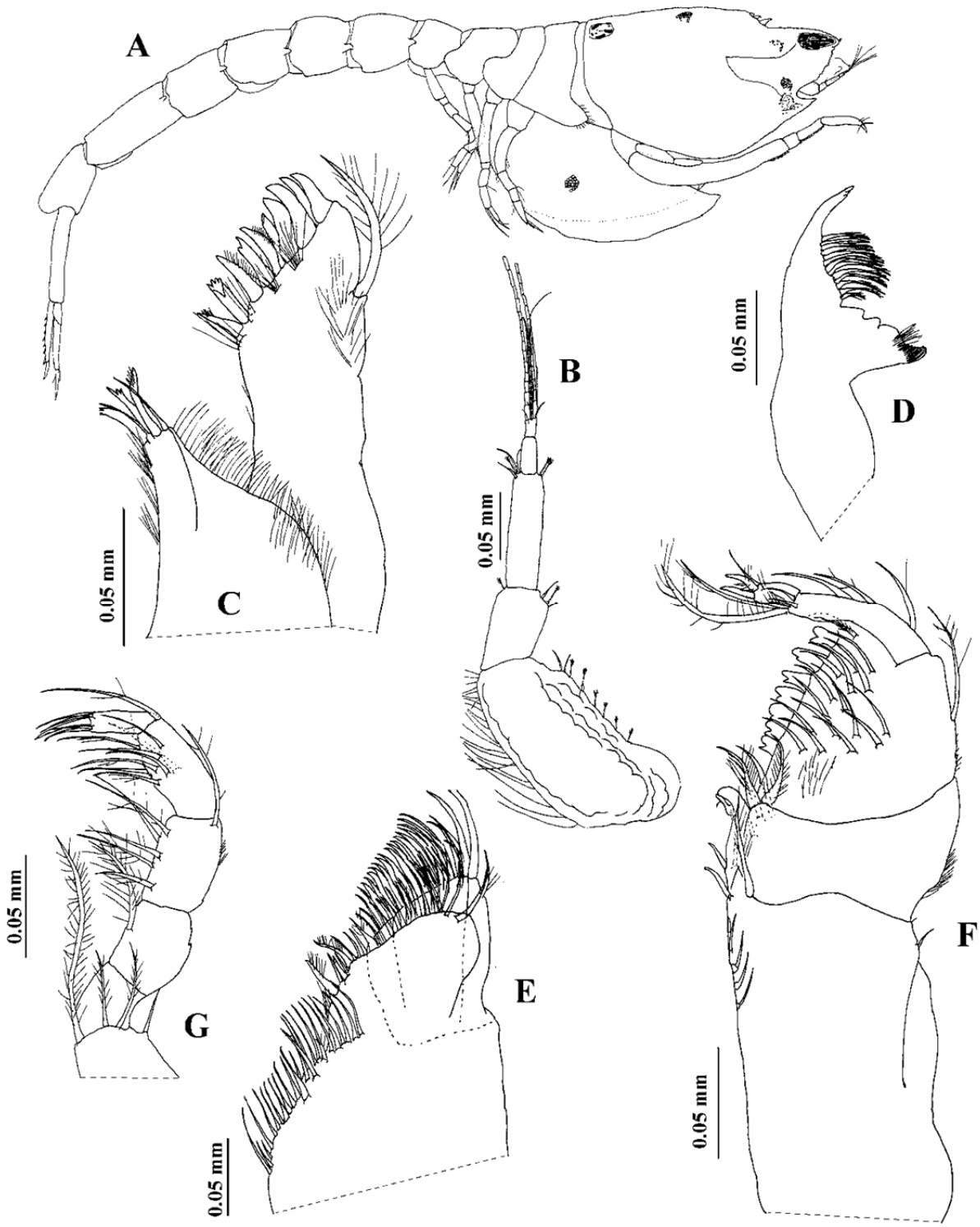


**FIGURE 8**. *Cyclaspis* sp. nov. 2, paratype, ovigerous female, 5.3 m, (UMAR-PERA-491), La Boquilla bay, Puerto Ángel, Oaxaca: A) lateral view; B) antenna 1; C) maxillule; D) left mandible; E) maxilla; F) maxilliped 1; G) maxilliped 2.

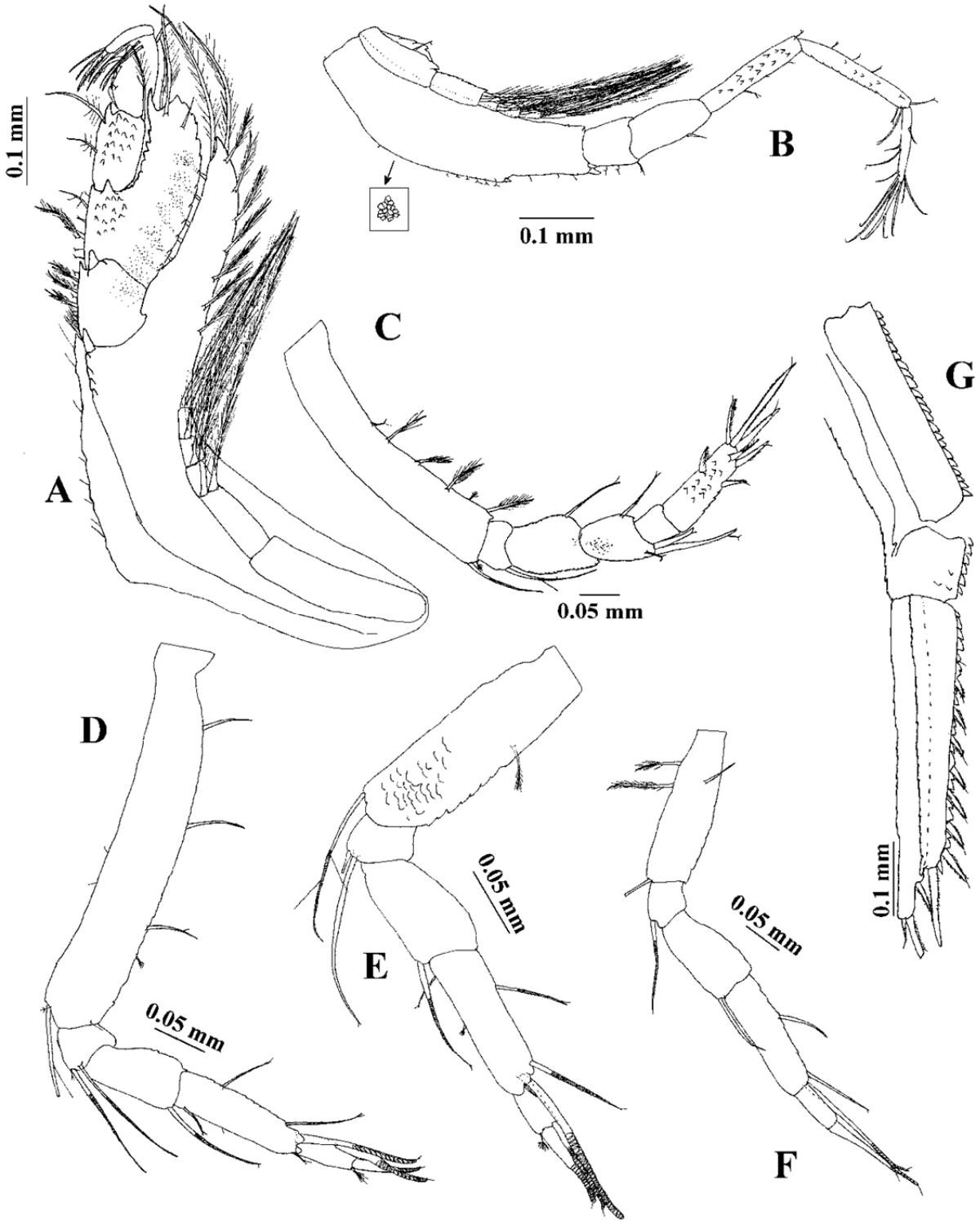


**FIGURE 9.** *Cyclaspis* sp. nov. 2, paratype, ovigerous female, 5.3 m, (UMAR-PERA-491), La Boquilla bay, Puerto Ángel, Oaxaca: A) maxilliped 3; B) pereopod 1; C) pereopod 2; D) pereopod 3; E) pereopod 4; F) pereopod 5; G) uropod.

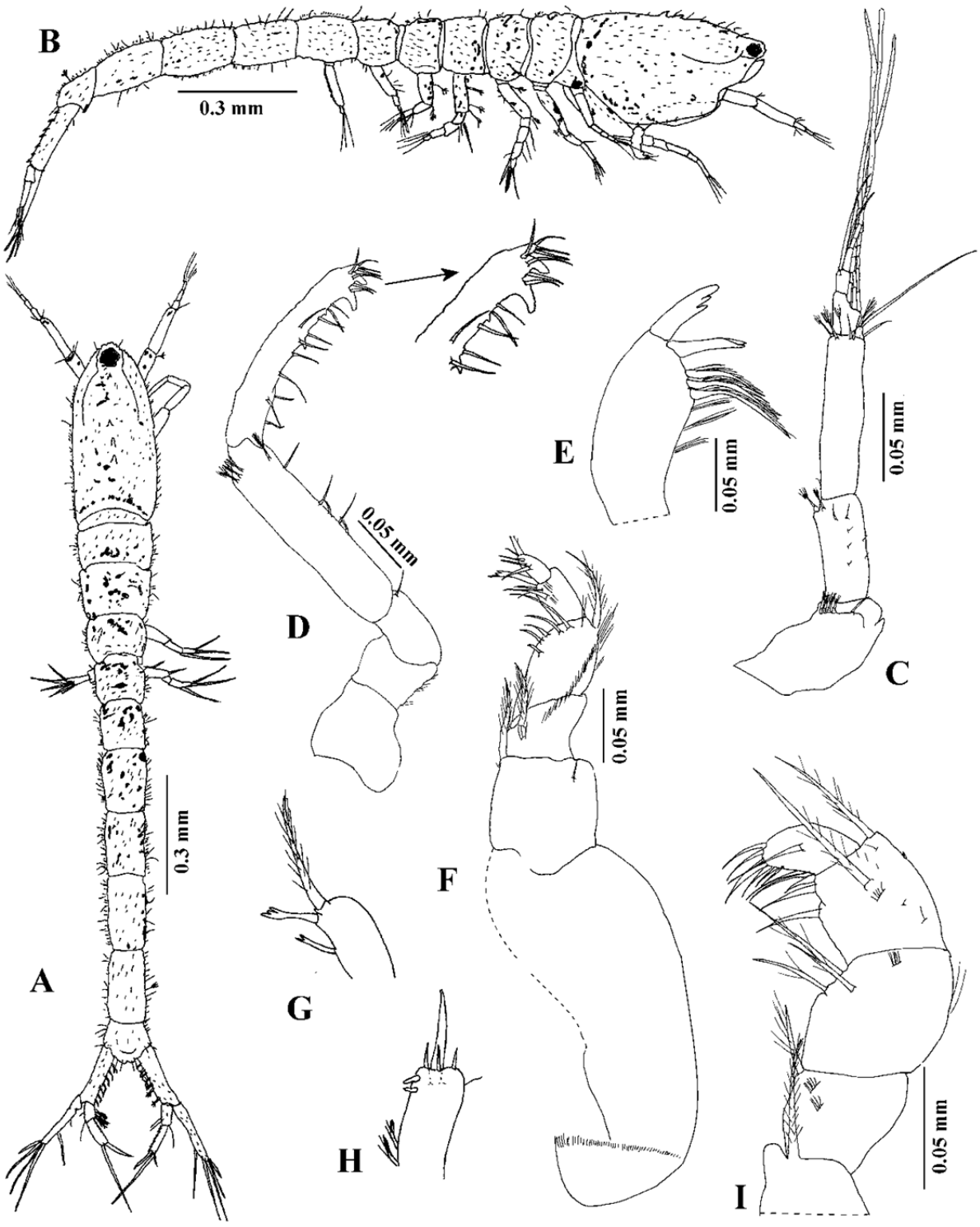


**FIGURE 10**. *Coricuma* sp. nov., paratype, adult male, 2.1 mm, (UMAR-PERA-493), Ventura beach, Arriaga, Chiapas: A) dorsal view; B) lateral view; C) antenna 1; D) antenna 2; E) left mandible; F) left maxilliped 1; G) detail of propodus of maxilliped 1; H) endite of maxilliped 1; I) maxilliped 2.

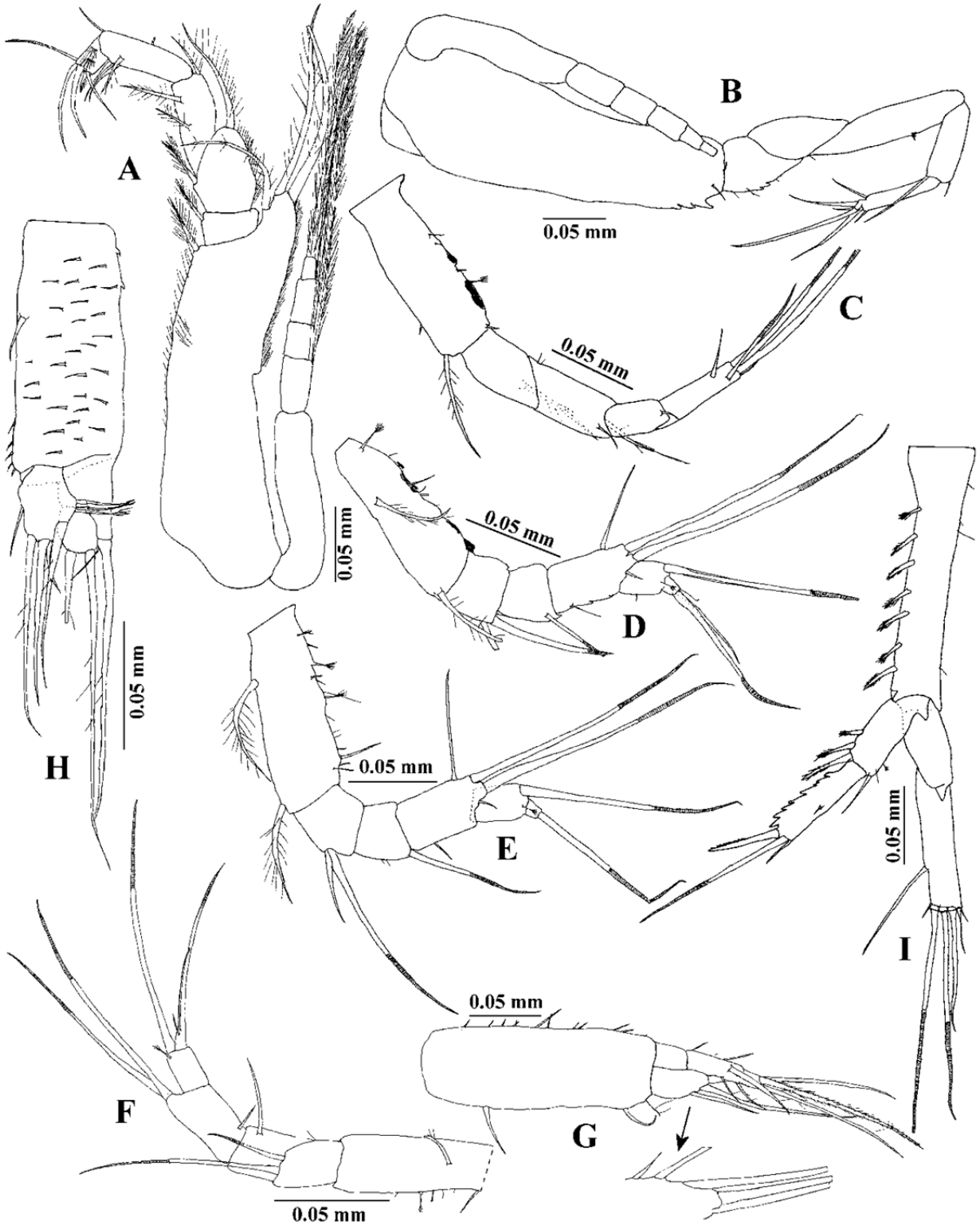


**FIGURE 11**. *Coricuma* sp. nov., paratype, adult male, 2.1 mm, (UMAR-PERA-493), Ventura beach, Arriaga, Chiapas: A) maxilliped 3; B) pereopod 1; C) pereopod 2; D) pereopod 3; E) pereopod 4; F) pereopod 5; G) pleopod 1; H) pleopod 2; I) uropod.

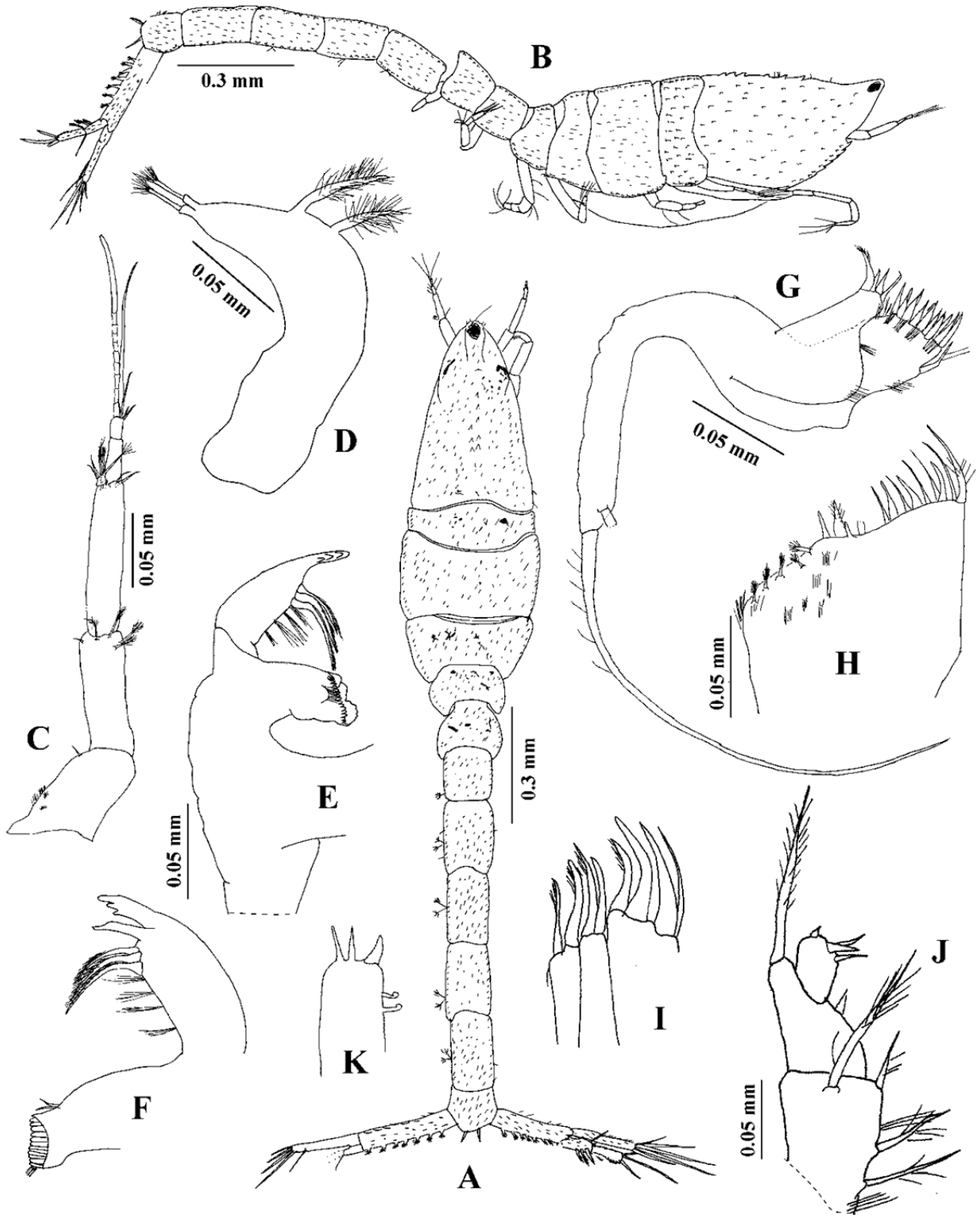


**FIGURE 12**. *Coricuma* sp. nov., paratype, ovigerous female, 2.0 mm, (UMAR-PERA-493), Ventura beach, Arriaga, Chiapas: A) dorsal view; B) lateral view; C) antenna 1; D) antenna 2; E) left mandible; F) right mandible; G) maxillule; H) broad endite of maxilla; I) narrow endites of maxilla; J) maxilliped 1; K) detail of maxilliped 1 of endite.

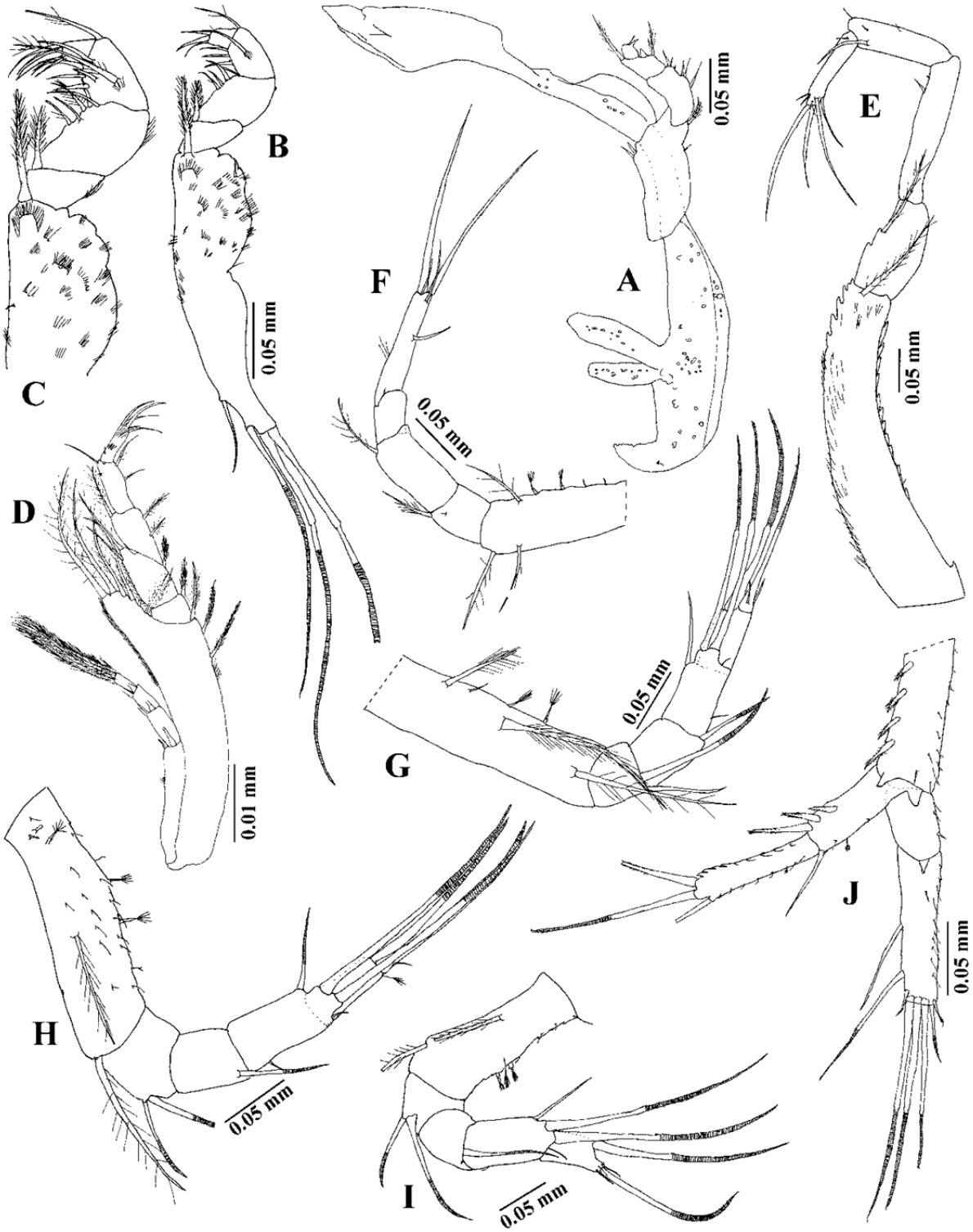


**FIGURE 13.** *Coricuma* sp. nov., paratype, ovigerous female, 2.0 mm, (UMAR-PERA-493), Ventura beach, Arriaga, Chiapas: A) left maxilliped 1; B) maxilliped 2; C) details of maxilliped 2; D) maxilliped 3; E) pereopod 1; F) pereopod 2; G) pereopod 3; H) pereopod 4; I) pereopod 5; J) uropod.

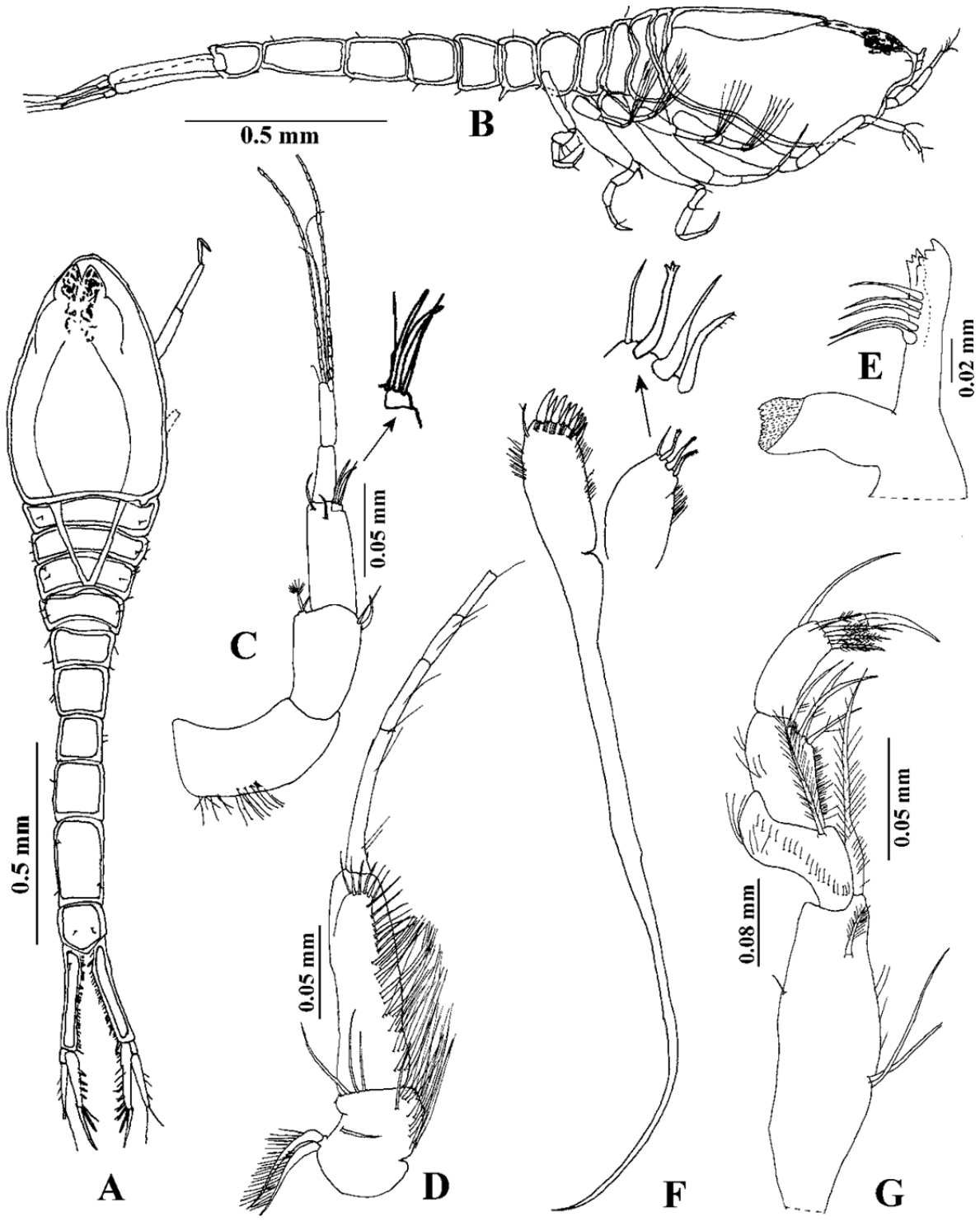


**FIGURE 14**. *Cumella* (*Cumewingia*) sp. nov., paratype, adult male, 1.7 mm, (UMAR-PERA-495), Corralero lagoon, Pinotepa Nacional, Oaxaca: A) dorsal view; B) lateral view; C) antenna 1; D) antenna 2; E) mandible; F) maxillule; G) maxilliped 2.

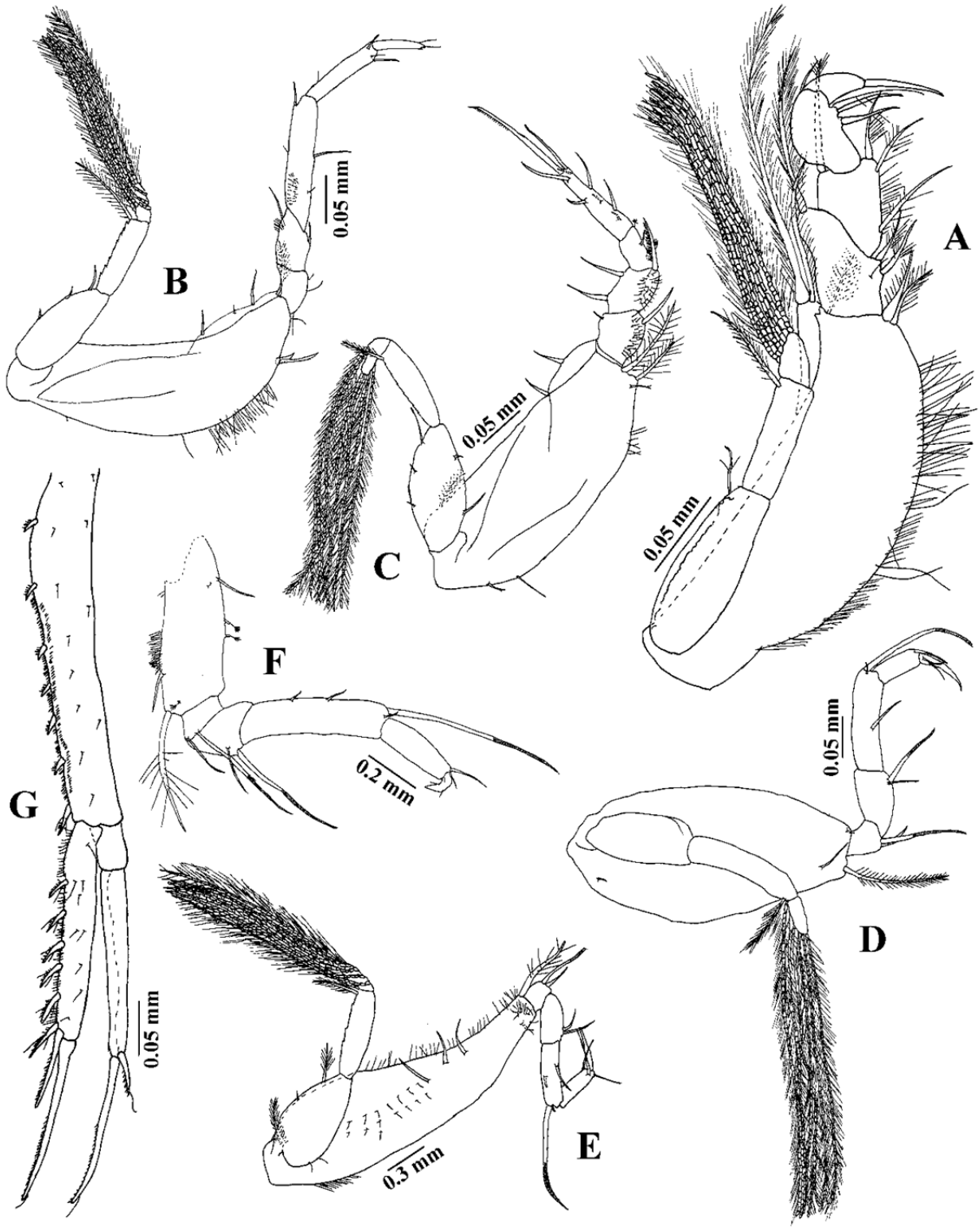


**FIGURE 15**. *Cumella* (*Cumewingia*) sp. nov., paratype, adult male, 1.7 mm, (UMAR-PERA-495), Corralero lagoon, Pinotepa Nacional, Oaxaca: A) maxilliped 3; B) pereopod 1; C) pereopod 2; D) pereopod 3; E) pereopod 4; F) pereopod 5; G) uropod.

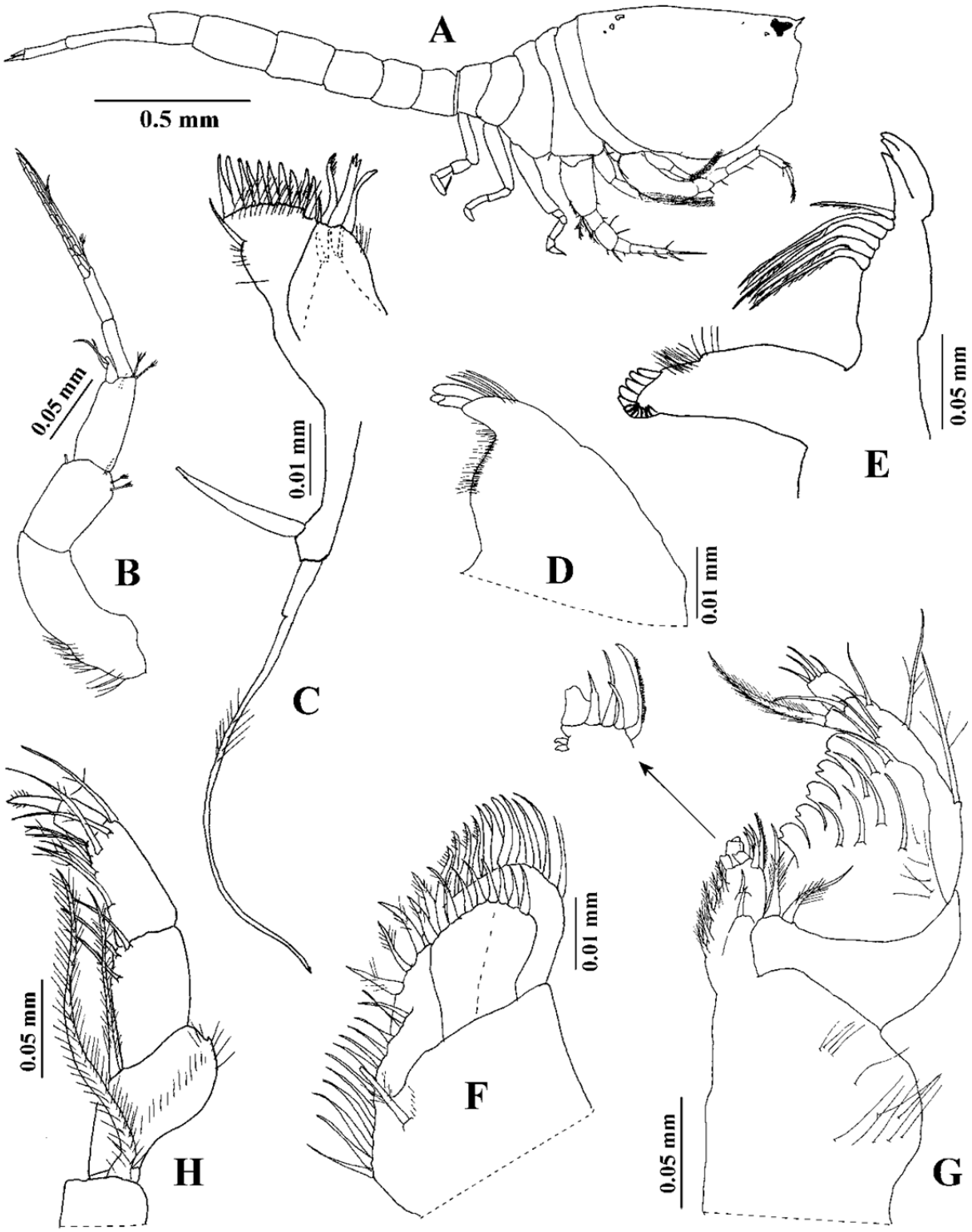


**FIGURE 16**. *Cumella* (*Cumewingia*) sp. nov., paratype, ovigerous female, 2.0 mm, (UMAR-PERA-495), Corralero lagoon, Pinotepa Nacional, Oaxaca: A) lateral view; B) antenna 1; C) maxillule; D) labium; E) mandible; F) maxilla; G) maxilliped 1; H) maxilliped 2.

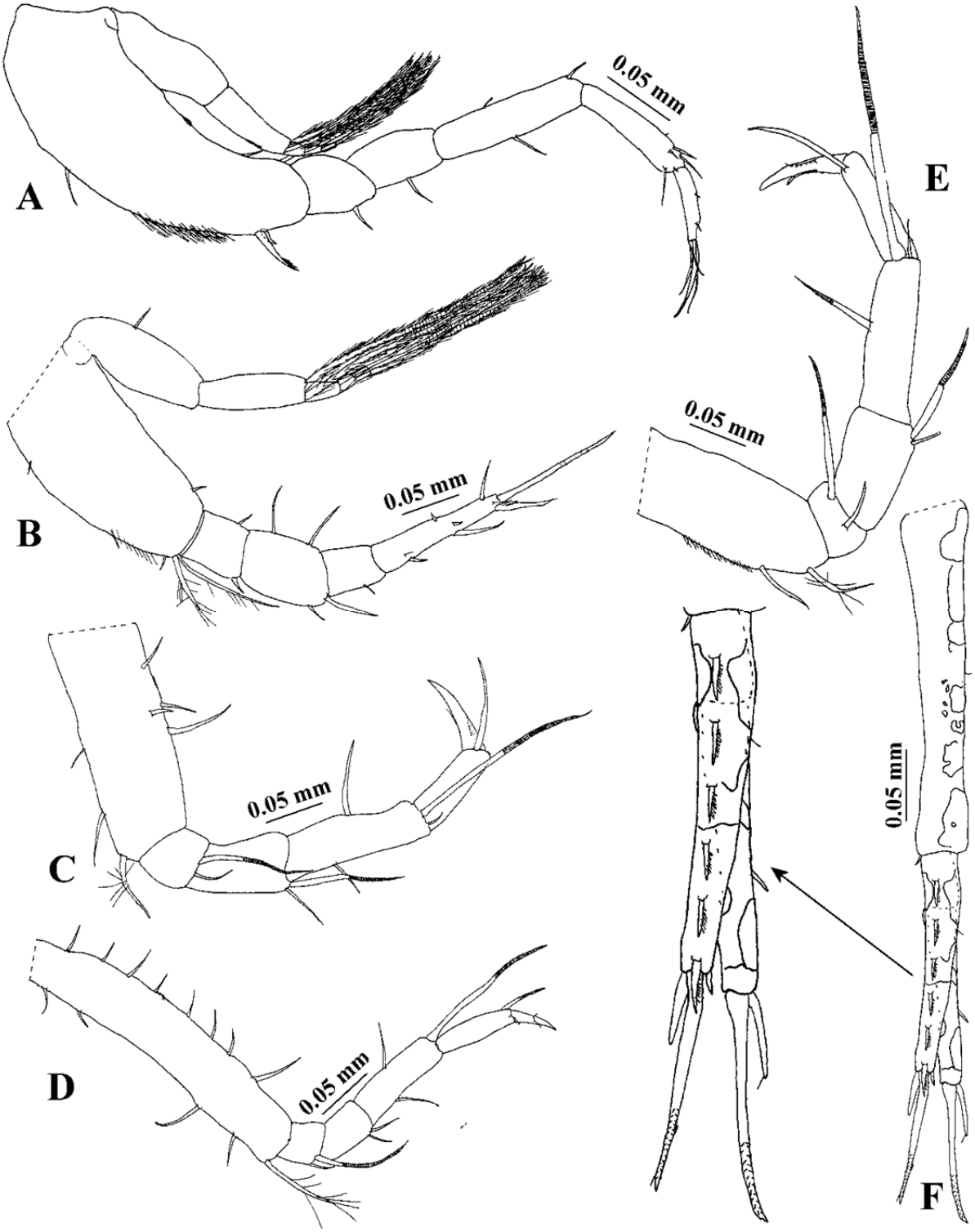


**FIGURE 17**. *Cumella* (*Cumewingia*) sp. nov., paratype, ovigerous female, 2.0 mm, (UMAR-PERA-495), Corralero lagoon, Pinotepa Nacional, Oaxaca: A) pereopod 1; B) pereopod 2; C) pereopod 3; D) pereopod 4; E) pereopod 5; F) uropod.

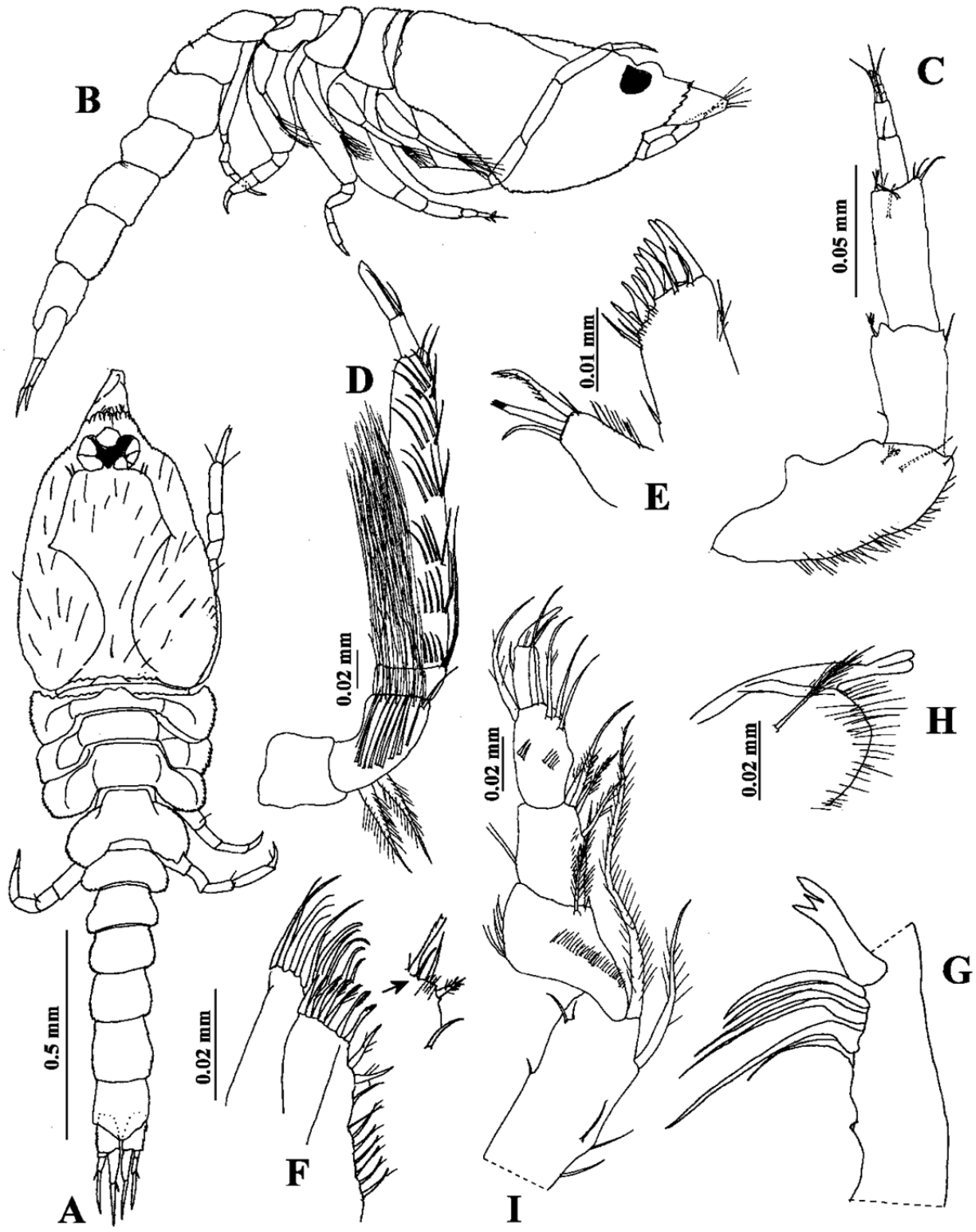


**FIGURE 18.** *Elassocumella* sp. nov., paratype**,** adult male, 1.9 mm, (UMAR-PERA-504), Mazunte, Tonameca, Oaxaca: A) dorsal view; B) lateral view; C) antenna 1; D) antenna 2; E) maxillule; F) maxilla; G) mandible; H) labium; I) maxilliped 2.

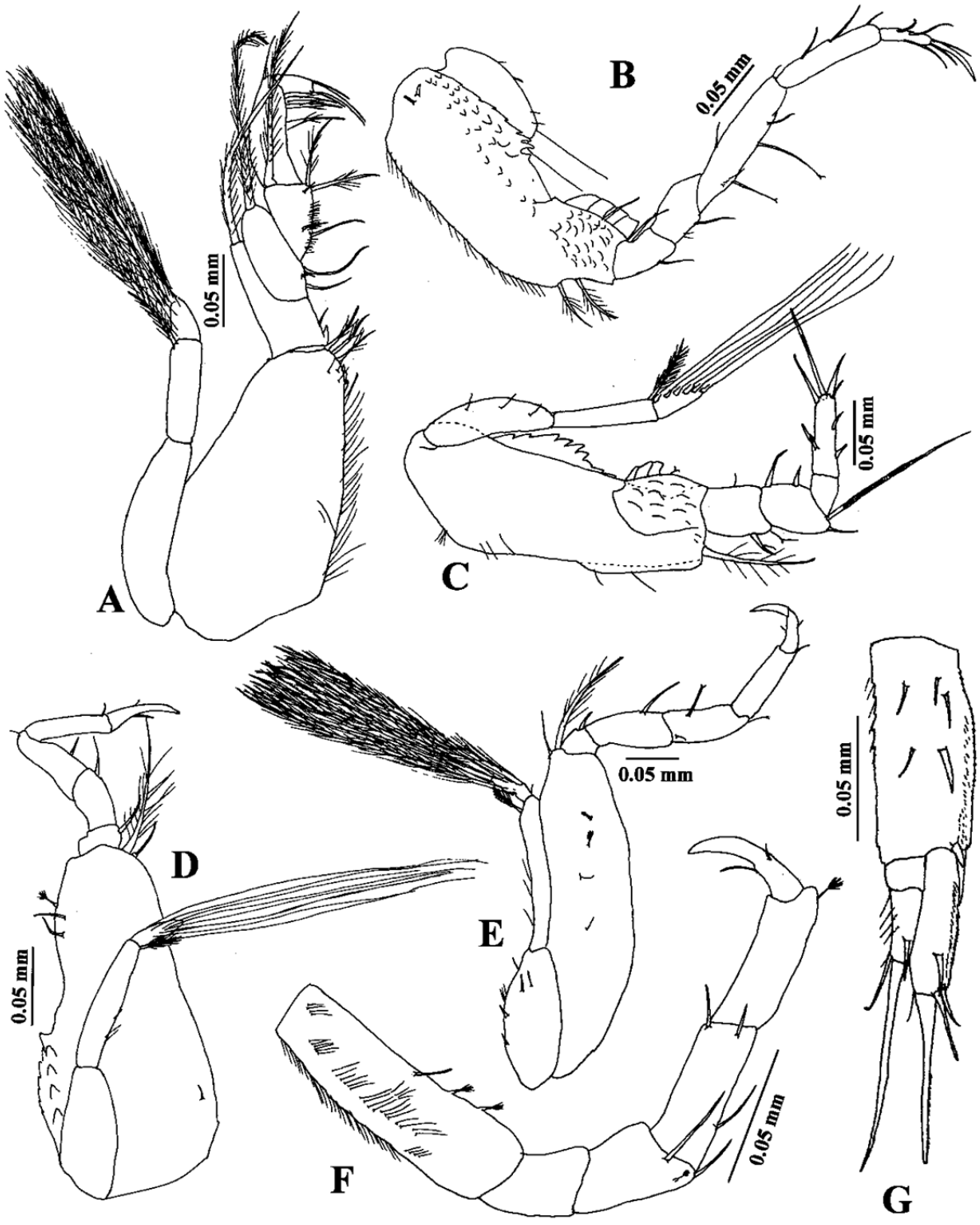


**FIGURE 19.** *Elassocumella* sp. nov., paratype, adult male, 1.9 mm, (UMAR-PERA-504), Mazunte, Tonameca, Oaxaca: A) maxilliped 3; B) pereopod 1; C) pereopod 2; D) pereopod 3; E) pereopod 4; F) pereopod 5; G) uropod.

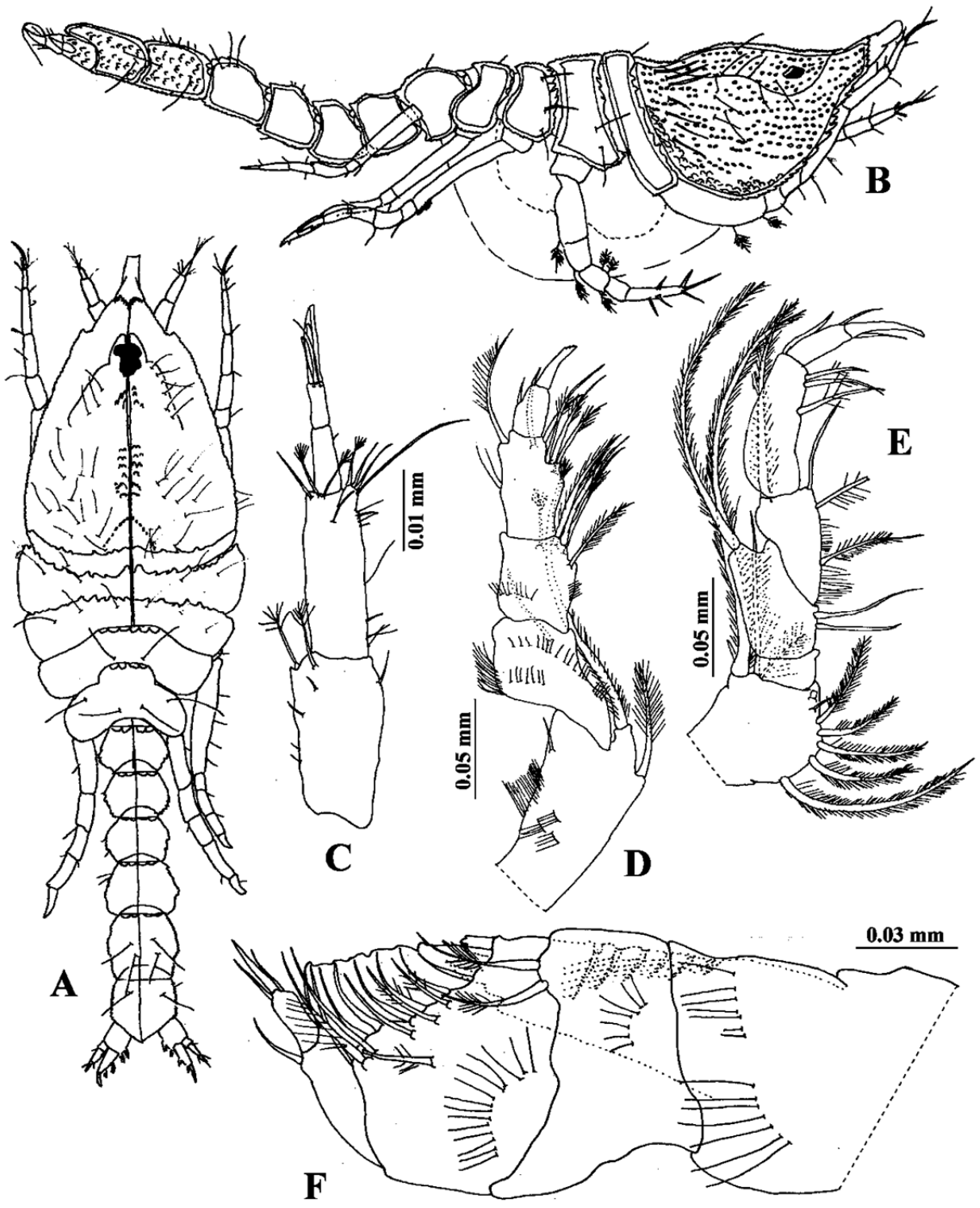


**FIGURE 20.** *Elassocumella* sp. nov., paratype, ovigerous female, 1.8 mm, (UMAR-PERA-504), Mazunte, Tonameca, Oaxaca: A) dorsal view; B) lateral view; C) antenna 1; D) maxilliped 2; E) maxilliped 3; F) maxilliped 1.

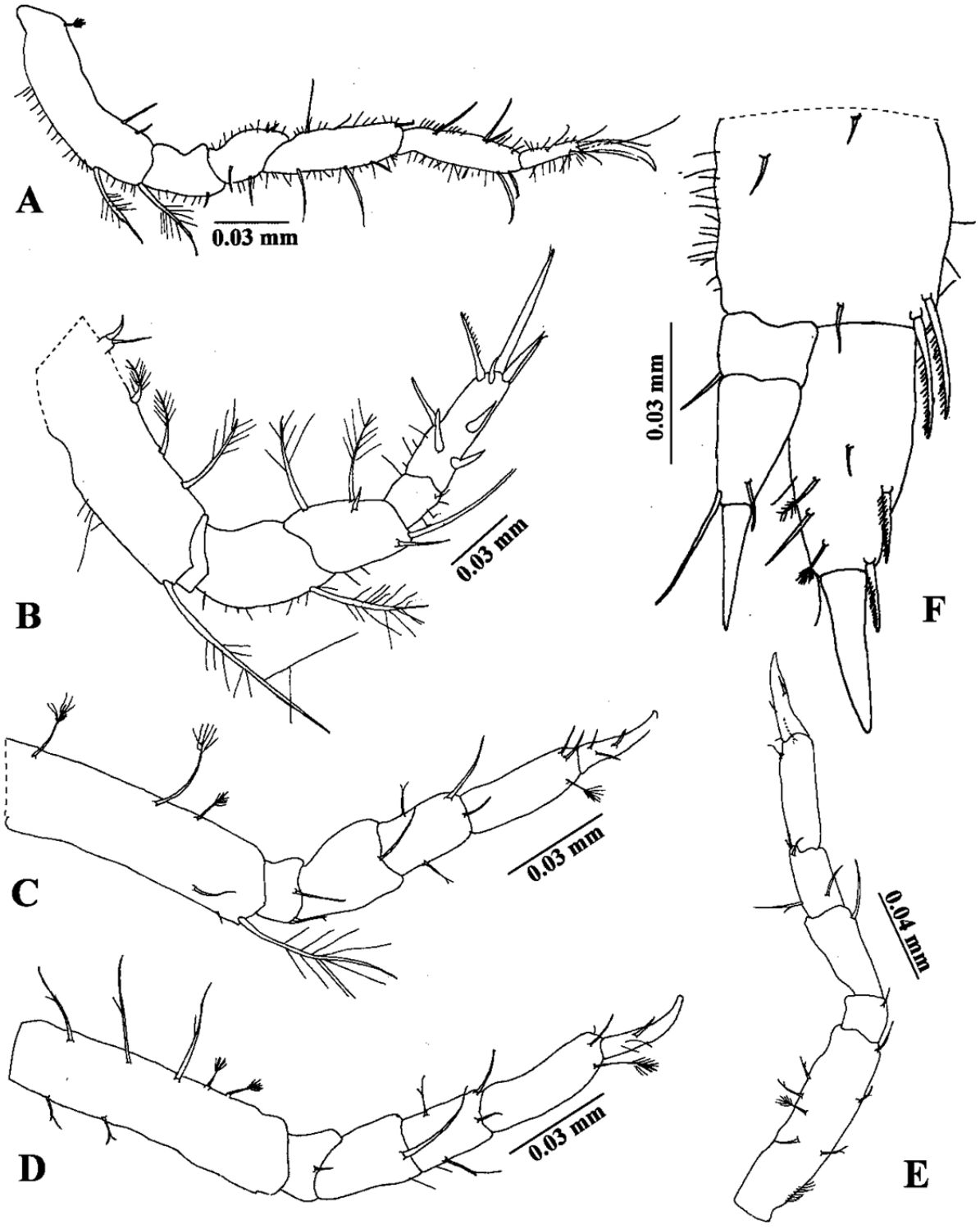


**FIGURE 21.** *Elassocumella* sp. nov., paratype, ovigerous female, 1.8 mm, (UMAR-PERA-504), Mazunte, Tonameca, Oaxaca: A) pereopod 1; B) pereopod 2; C) pereopod 3; D) pereopod 4; E) pereopod 5; F) uropod.

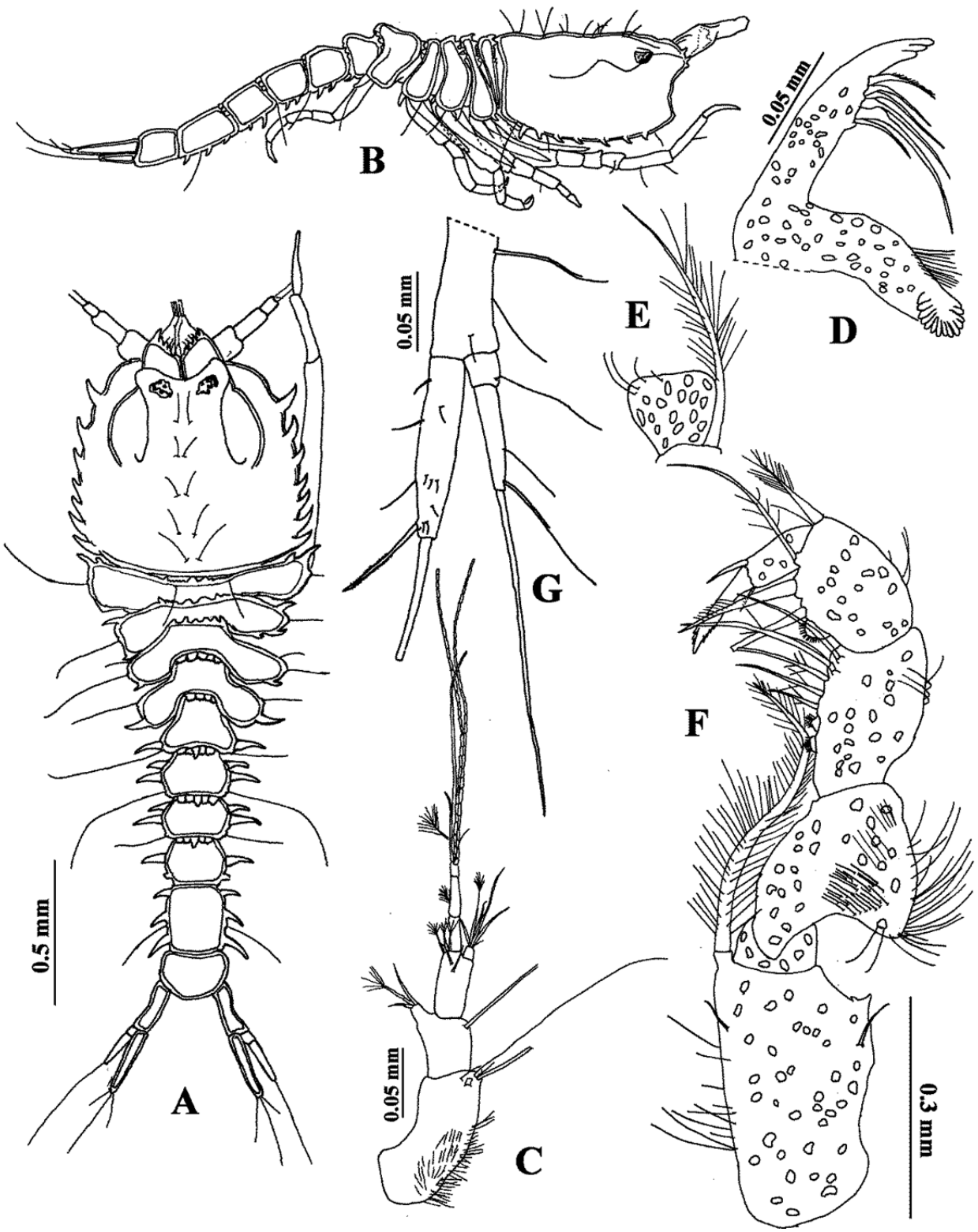


**FIGURE 22**. *Schizotrema* sp. nov., paratype, adult male, 2.3 mm, (UMAR-PERA-521), San Agustín bay, Huatulco, Oaxaca: A) dorsal view; B) lateral view; C) antenna 1; D) mandible; E) distal article of maxilliped 1; F) maxilliped 2; G) uropod.

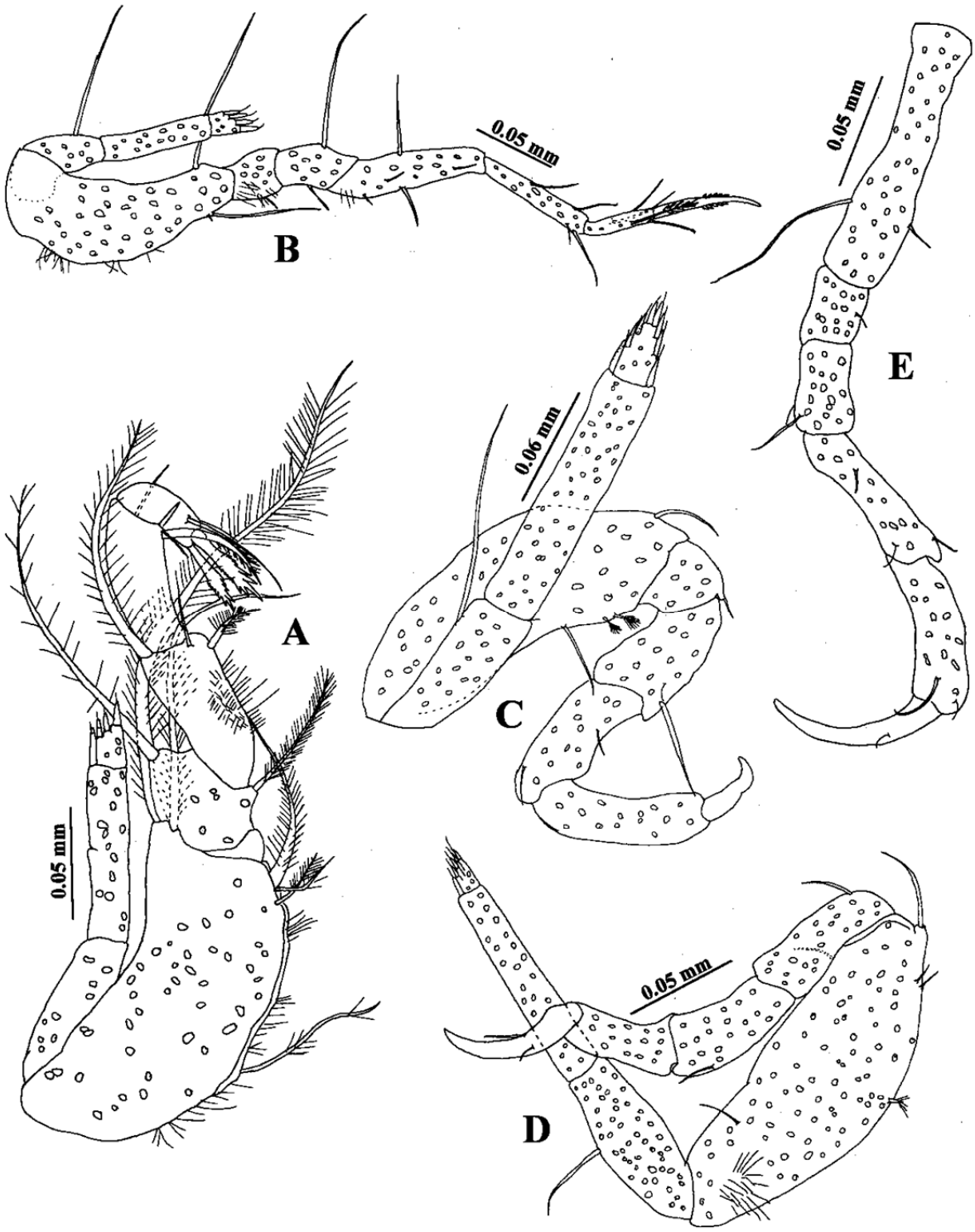


**FIGURE 23**. *Schizotrema* sp. nov., paratype, adult male, 2.3 mm, (UMAR-PERA-521), San Agustín bay, Huatulco, Oaxaca: A) maxilliped 3; B) pereopod 1; C) pereopod 3; D) pereopod 4; E) pereopod 5.

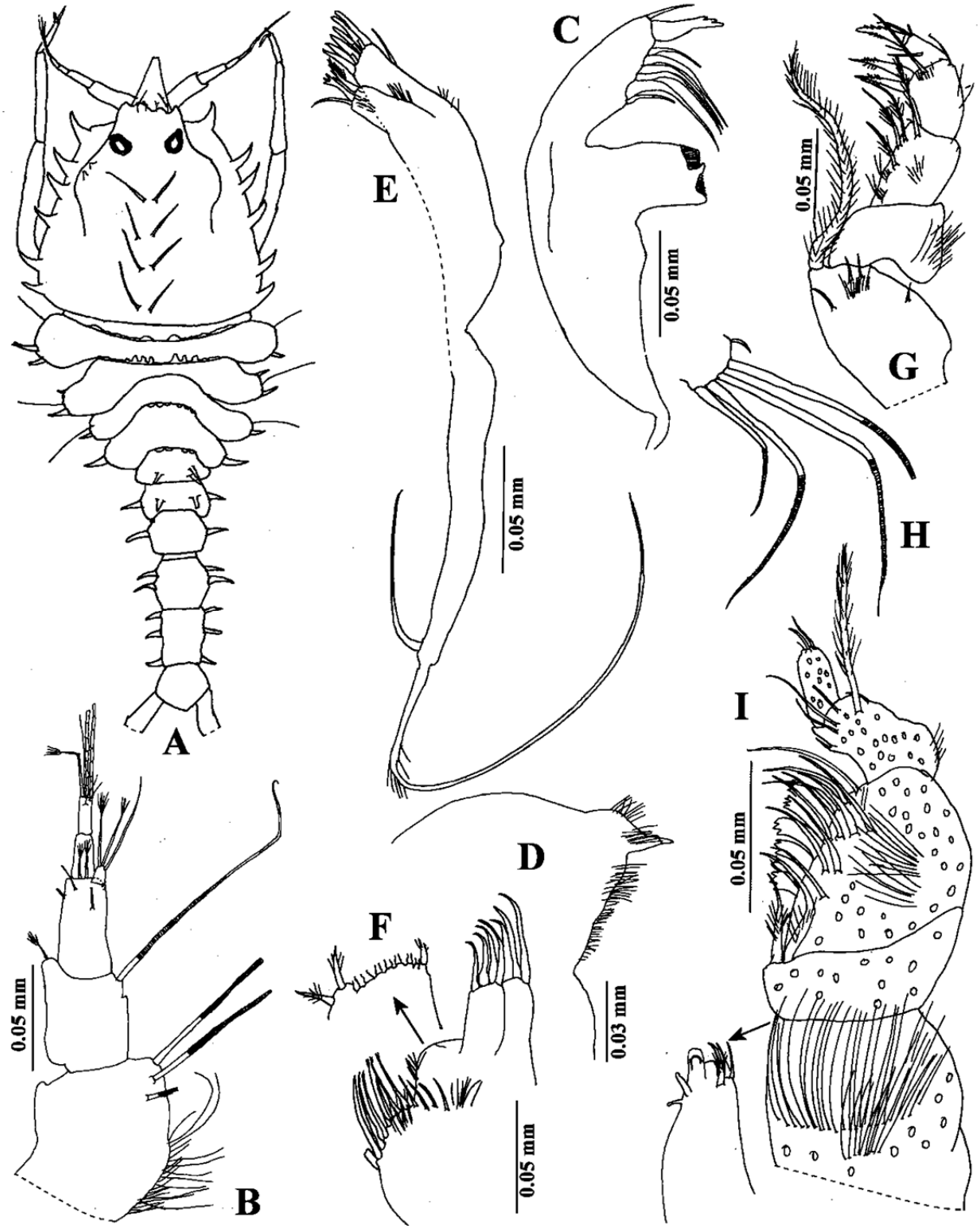


**FIGURE 24**. *Schizotrema* sp. nov., paratype, ovigerous female, 2.0 mm (UMAR-PERA-521), San Agustín bay, Huatulco, Oaxaca: A) dorsal view; B) antenna 1; C) mandible; D) labium; E) maxillule; F) maxilla; G) maxilliped 2; H) palp of maxilliped 2; I) maxilliped 1.

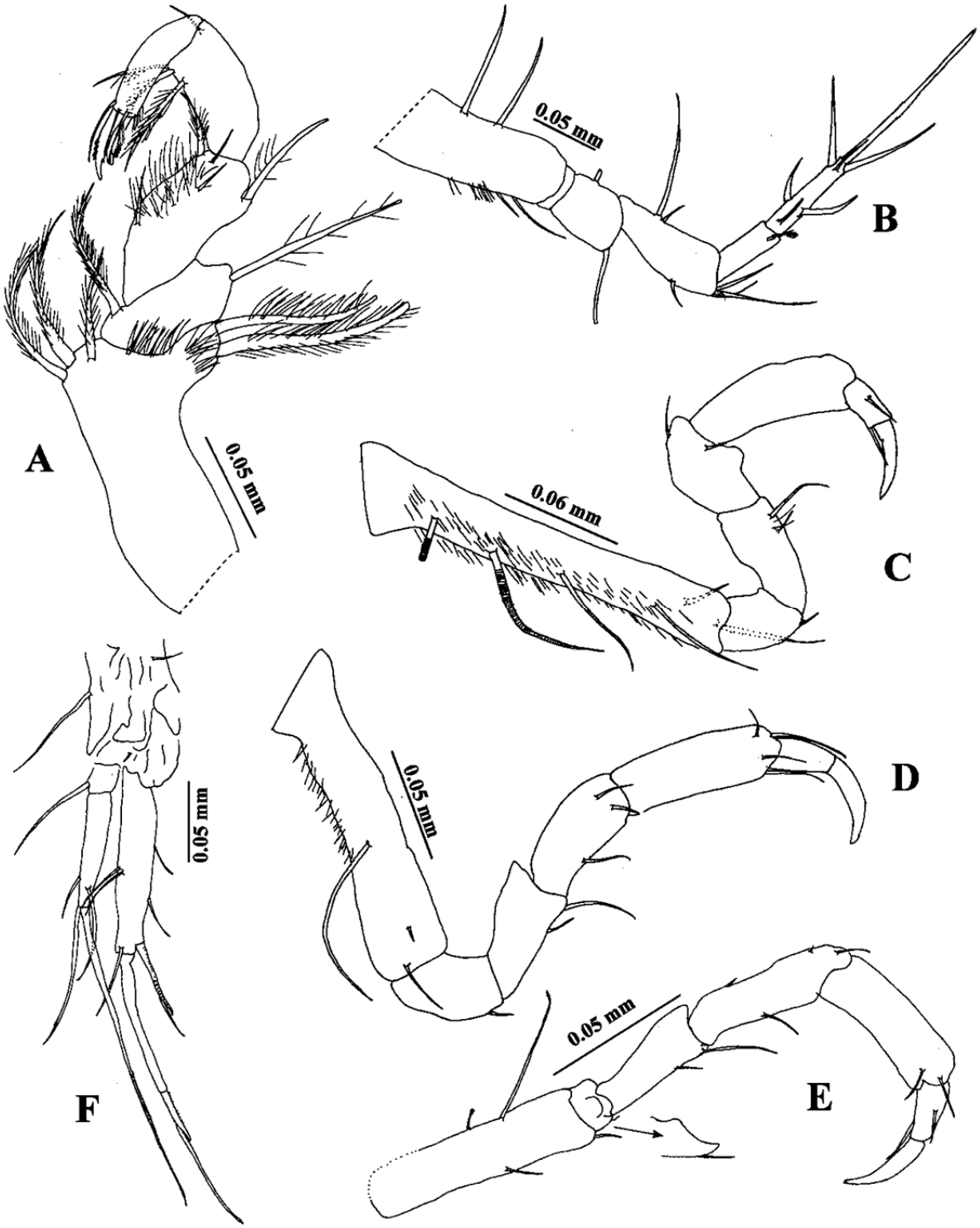


**FIGURE 25**. *Schizotrema* sp. nov., paratype, ovigerous female, 2.0 mm (UMAR-PERA-521), San Agustín bay, Huatulco, Oaxaca: A) maxilliped 3; B) pereopod 2; C) pereopod 3; D) pereopod 4; E) pereopod 5; F) uropod.

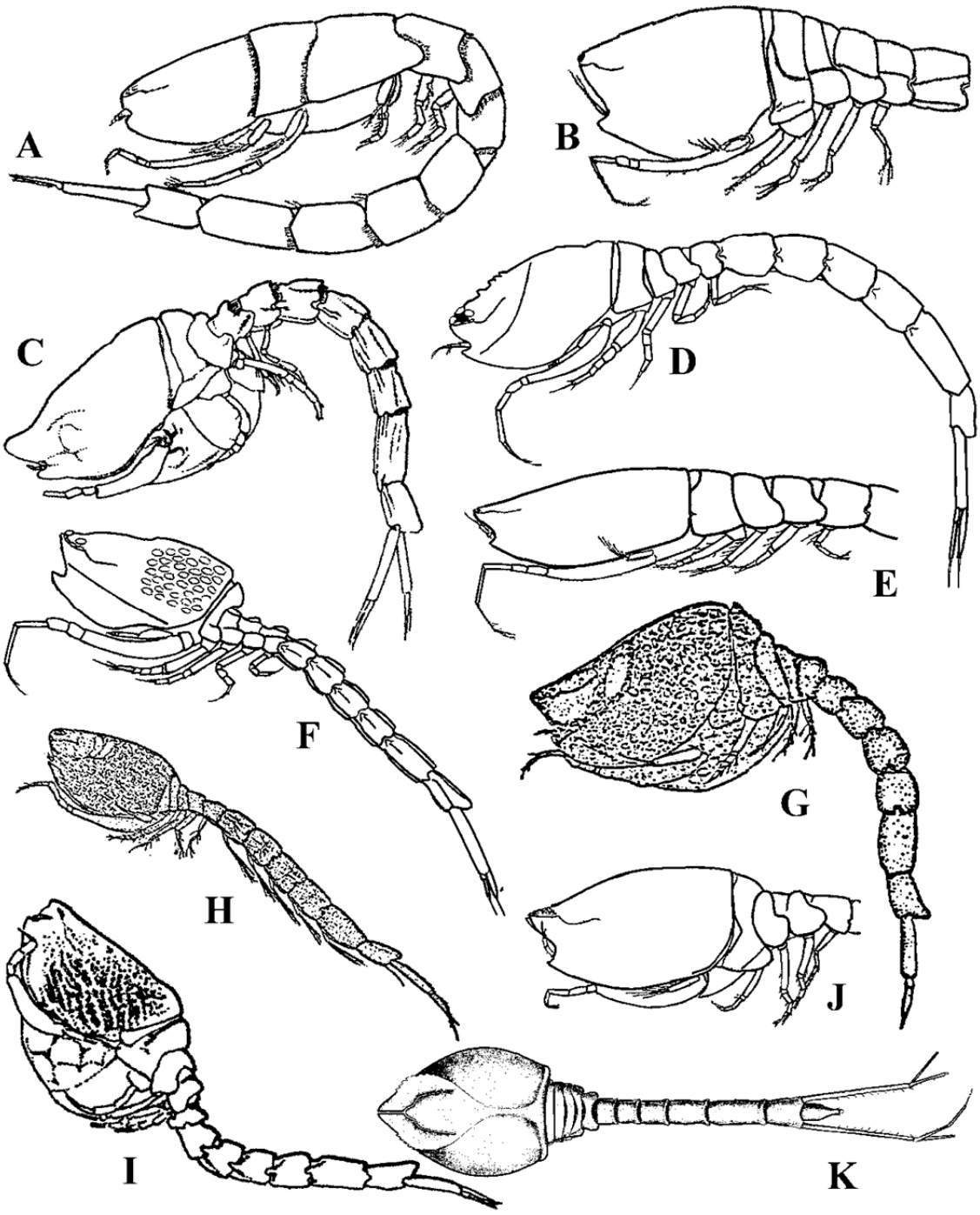


**FIGURE 26.** *Habitus*. Family Bodotriidae: A) *Leptocuma forsmani* ♀; B) *Cyclaspis testudinum* ♀; C) *Cyclaspis bituberculata* ♀; D) *Cyclaspis breedyae* ♀ Petrescu & Heard, 2004; E) *Cyclaspis dolera* ♀ Zimmer, 1944; F) *Cyclaspis vargase* ♀; G) *Cyclaspis* C ♀; H) *Cyclaspis* C ♂; I) *Cyclaspis concepcionensis* ♀; J) *Cyclaspis nubila* ♀. Family Diastylidae: K) *Leptostylis menziesi* ♂. For credits of figures used see Appendix.

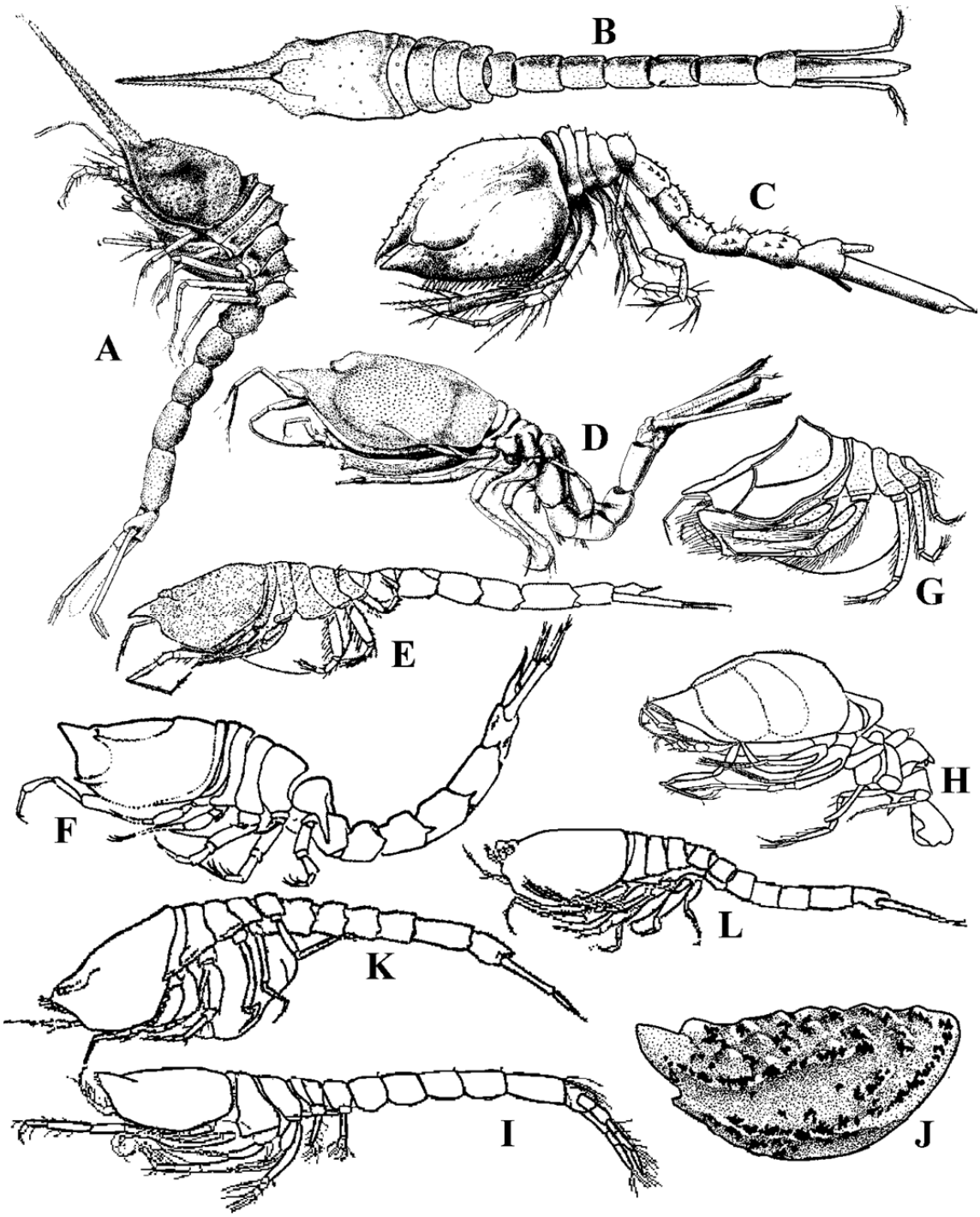


**FIGURE 27**. *Habitus*. Family Diastylidae: A) *Vemakylindrus costaricanus* ♀; B) *Vemakylindrus gladiger* ♀; C) *Makrokylindrus americanus* ♂; D) *Makrokylindrus menziesi* ♂; E) *Oxyurostylis pacifica* ♀; F) *Diastylis calderoni* ♀; G) *Diastylis californica* ♀; H) ?*Diastylis tenebricosa* ♀; family Leuconidae: I) *Leucon* (*Crymoleucon*) *bishopi* ♀; family Nannastacidae: J) carapace of *Campylaspis rubromaculata* ♀; K) *Cumella* (*Cumewingia*) *quintinensis* ♀; L) *Cumella* (*Cumewingia*) *quintinensis* ♂. For credits of figures used see Appendix.

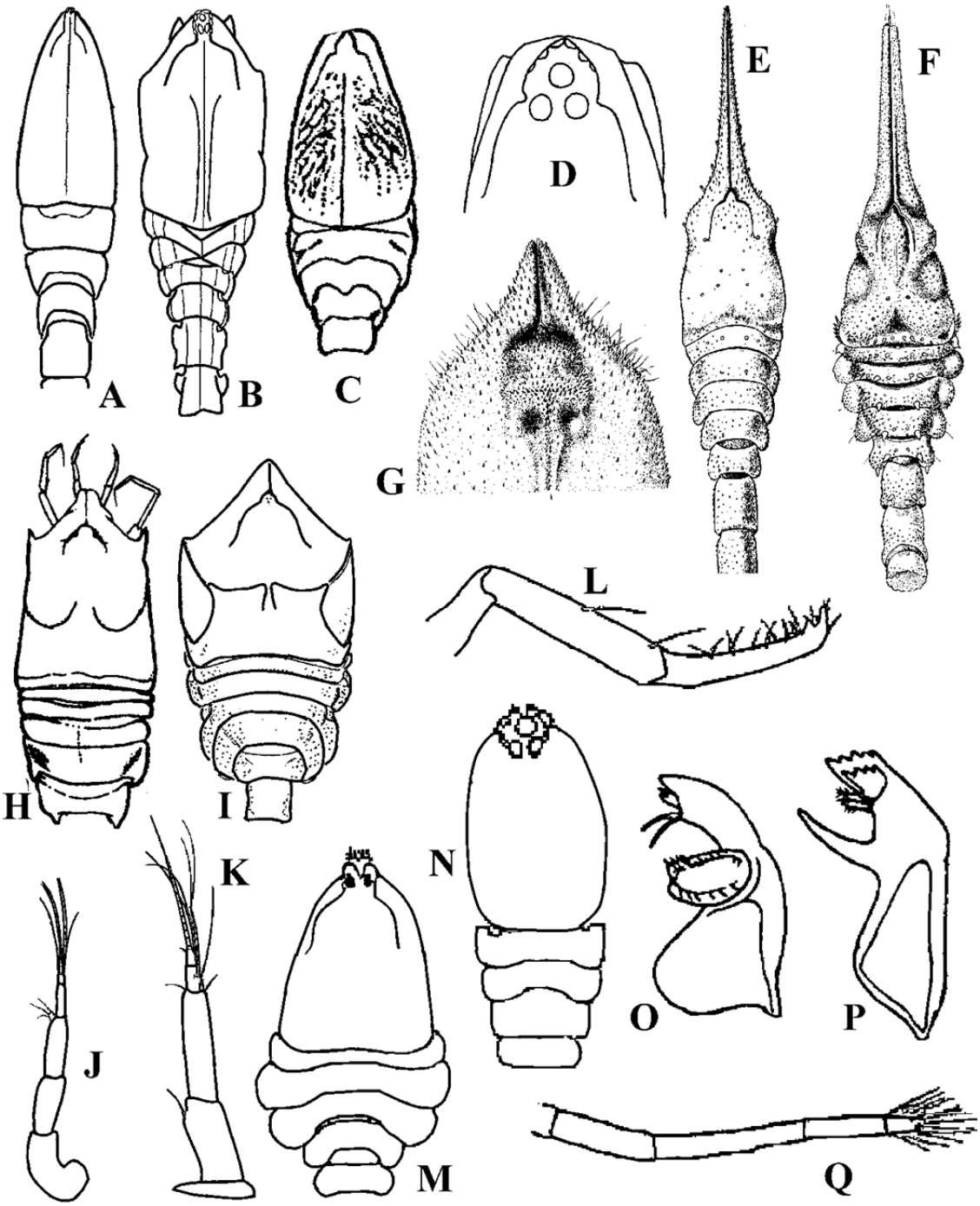


**FIGURE 28**. Carapace and part of pereon/pleon. Family Bodotriidae: A) *C. dolera* ♀; B) *C. vargase* ♀; C) *C. concepcionensis* ♀; D) *C. concepcionensis* ♂. Family Diastylidae: E) *V. gladier* ♀; F) *V. costaricanus* ♀; G) *M. menziesis* ♂; H) *D. calderoni* ♀; I) *D. californica* ♀; family Nannastacidae: M) *C. C. quintinensis* ♀; N) *C.C. quintinensis* ♂. Antenna 1, family Bodotriidae: J) *C. breedyae* ♀; family Leuconidae: K) *Coricuma nicoyensis* ♀. Antenna 2, family Leuconidae: L) *Coricuma nicoyensis* ♂ Mandibles, family Nannastacidae: O) nannastacids general type; P) *Campylaspis* type. Pereopod 2, family Bodotriidae: Q) *L. forsmani* ♀. For credits of figures used see Appendix.

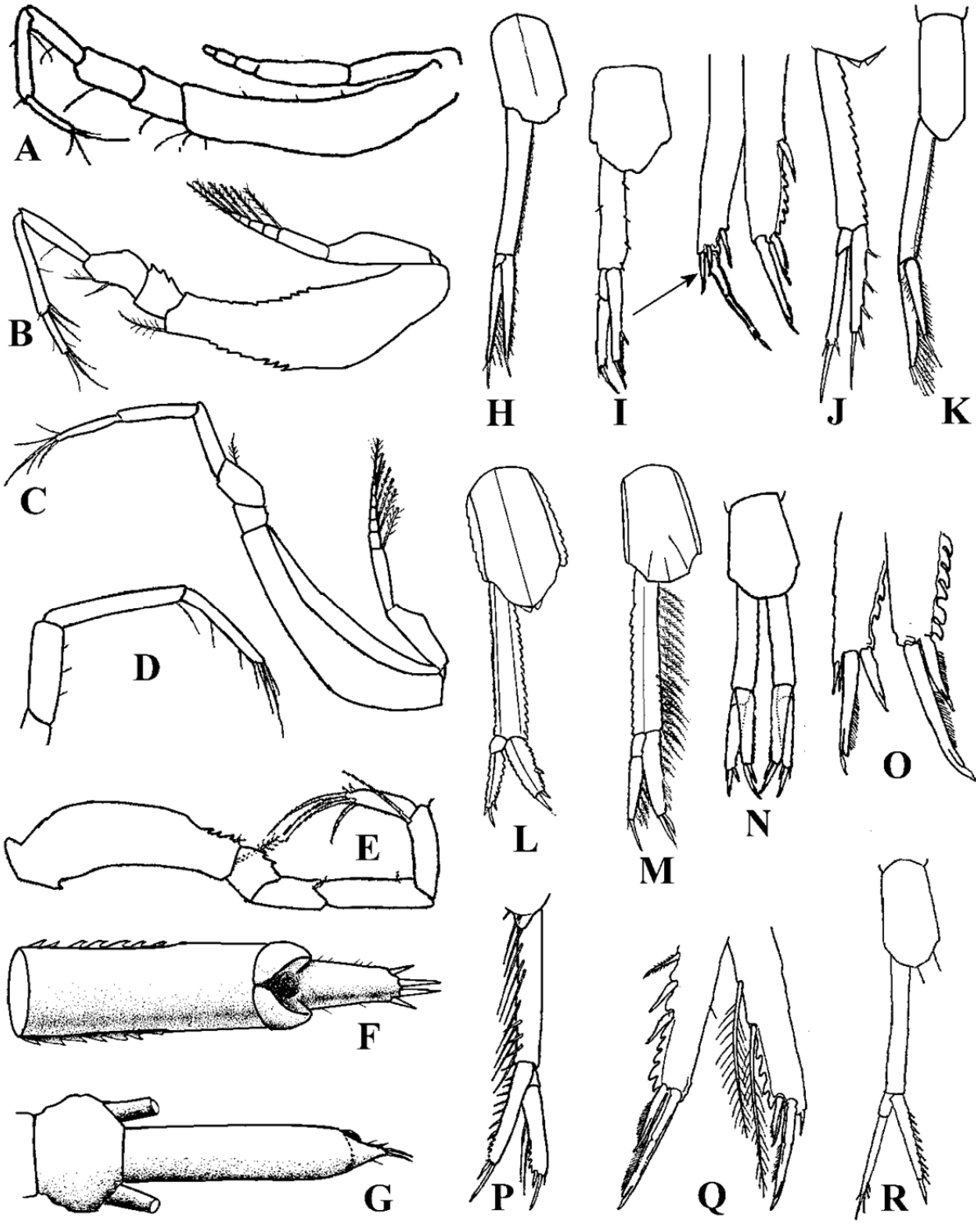


**FIGURE 29.** Pereopods 1. Family Bodotriidae: A) *C. bituberculata* ♀; B) *C. vargase* ♀; C) *C. breedyae* ♀; D) *C. dolera* detail of carpus-propodus ♀; family Leuconidae: E) *C. nicoyensis* ♀. Telson, family Distylidae: F); *M. menziesis* ♂; G) *M.americanus* ♂. Uropods, family Bodotriidae: H) *C. testudinium* ♀; I) *C. bituberculata* ♀; J) *C. breedyae* ♀; K) *C. dolera* ♀; L) *C. vargase* ♀; M) *C. vargase* ♂; N-O) *C. concepcionensis* ♀; P-Q) *C. concepcionensis* ♂; R) *C. nubila* ♀. For credits of figures used see Appendix.

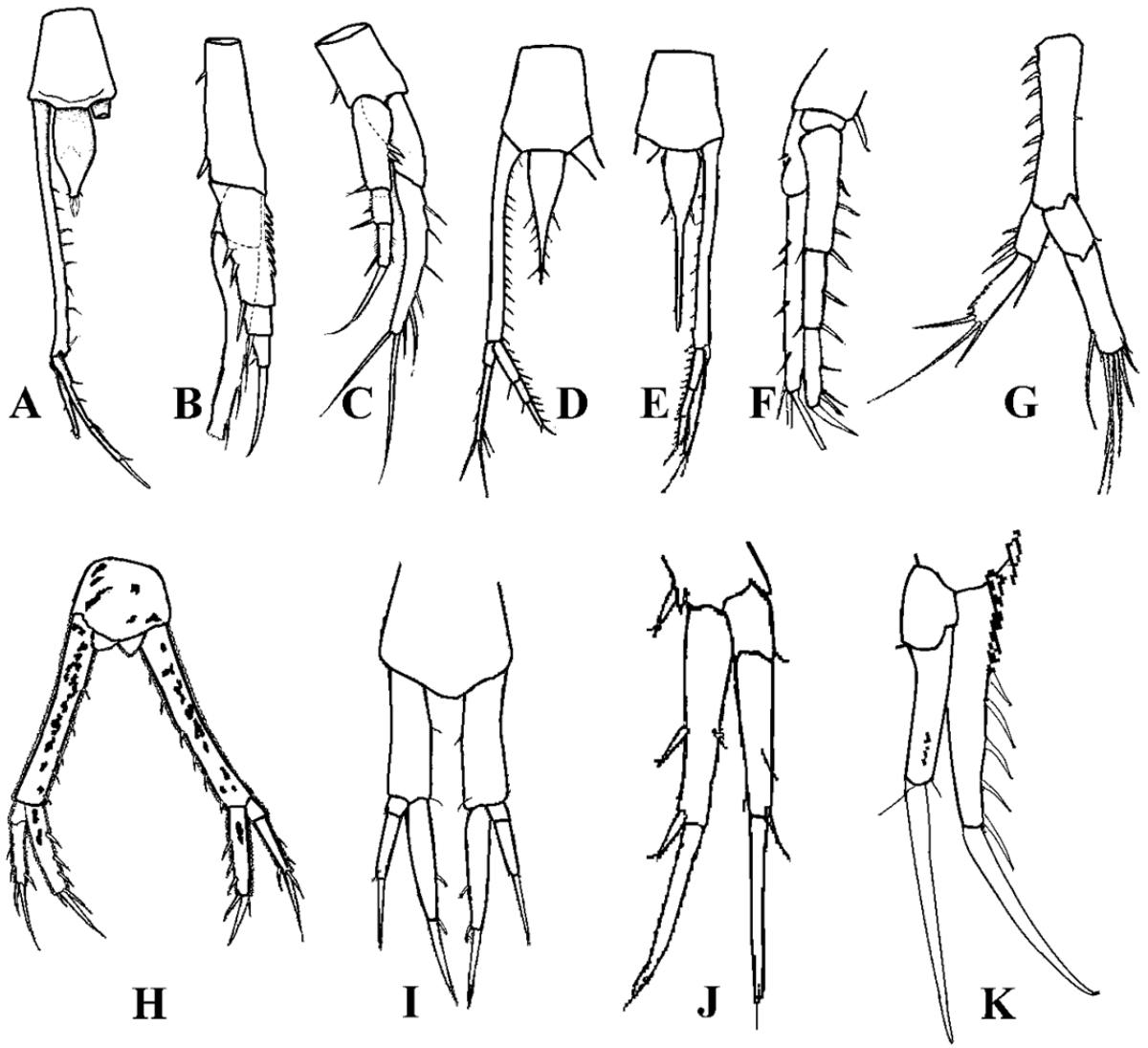


**FIGURE 30.** Uropods, family Diastylidae: A) *L. menziesi*; B) *V. costaricanus* ♀; C) *V. gladier* ♀; D) *O. pacifica* ♀; E) *Oxyurostylis tertia* ♀; F) *D. calderoni* ♀; family Leuconidae: G) *C. nicoyensis* ♀; family Nannastacidae: H) *C. rubromaculata*; I) *Cumella* (*Cumella*) *californica* ♀; J) *C.C. quintinensis* ♀; K) *C.C. quintinensis* ♂. For credits of figures used see Appendix.

# CONCLUSIONES GENERALES

De 378 ejamplares analizados, para el Pacífico sur de México se identificaron seis nuevas especies pertenecientes a las familias Bodotriidae, Leuconidae y Nannastacidae. La familia Bodotriidae estuvo representada por el género *Cyclaspis* con dos especies, *Cyclaspis* sp. nov. 1 que es completamente diferente a cualquier otra especies de *Cyclaspis* registrada para el Pacífico oriental y aunque la especie más cercana es *C. nubila* (Corona del Mar, California), esta se diferencía porque *Cyclaspis* sp. nov. 1 muestra tanto el endópodo como el exópodo uropodal con la seta terminal fusionada, mientras que en *C. nubila* la seta terminal no está fusionada; por su parte, *Cyclaspis* sp. nov. 2 se asemeja a *C. breedyae* (Golfo de Nicoya, Costa Rica) y estas son diferentes porque *Cyclaspis* sp. nov. 2 tiene 28 espinas en el margen interno del pedúnculo uropodal, mientras que *C. breedyae* muestra 14 espinas como máximo.

Para la familia Leuconidae el género *Coricuma* estuvo representado con la especie *Coricuma* sp. nov., que es similar a *C. nicoyensis* (loc. tipo: Golfo de Nicoya, Costa Rica), pero son disímiles porque *Coricuma* sp. nov. presenta nueve espinas en el margen interno del segundo artejo del endópodo uropodal, mientras que *C. nicoyensis* tiene seis espinas como máximo.Con respecto a la familia Nannastacidae, se encontraron tres géneros: *Cumella*, *Elassocumella* y *Schizotrema*. Del género *Cumella*, se encontró una especie *Cumella* (*Cumewingia*) sp. nov. diferente a cualquier otra especie de la costa del continente americano, la especie más cercana es *C.* (*C.*) *quintinensis* (Bahía San Quintín, Baja California, México), sin embargo las hembras de *Cumella* (*Cumewingia*) sp. muestran seis espinas en el margen interno del endópodo uropodal, mientras que en *C.C. quintinensis* sólo hay dos espinas.

Para el género *Elassocumella* se identificó la especie *Elassocumella* sp. nov. que es similar a la especie *E. microropus* (Florida, E.U.A.), pero son diferentes principalmente porque la hembra de *Elassocumella* sp. nov muestra dos setas plumosas en el margen interno del pedúnculo uropodal, mientras que *E. microropus* presenta dos espinas. Y finalmente el género *Schizotrema* estuvo representado por la especie *Schizotrema* sp. nov. que es completamente diferente a cualquier otra especie de *Schizotrema* registrada en las costas de América y cuya especie más cercana es *S. depressum* (Tailandia), sin embargo estas se diferencian porque *Schizotrema* sp. nov. tiene seis pares de espinas en el caparazón, mientras que *S. depressum* tiene 11 pares.

Con respecto a su distribución, los géneros *Coricuma*, *Elassocumella* y *Schizotrema* ampliaron su ámbito de distribución. *Coricuma*, extiende su distribución desde el Golfo de Nicoya, Costa Rica a Chiapas, México. Asimismo, los géneros *Elassocumella* y *Schizotrema* se registran por primera vez

en el Pacífico Oriental, ya que originalmente habían sido reconocidos para el Atlántico occidental y/o el oceáno Índico. Adicionalmente, las especies *Coricuma* sp. nov. y *Elassocumella* sp. nov. representan la segunda especie descrita a nivel mundial para cada género, además de que para *Elassocumella*, se describe por primera vez un macho.

Por otra parte, la composición faunística de cumáceos del Pacífico oriental tropical aumentó de 24 a 30 especies. Lo anterior es porque previo a este trabajo, las provincias Panámica y de Cortés eran consideradas las áreas con el mayor número de registros litorales (10), seguidas de la provincia de Galápagos (2), mientras que en la provincia mexicana no se conocían registros; posterior a este estudio, la provincia mexicana ocupa la tercer provincia con más registros (seis) del POT. Cabe destacar que la presente investigación es un trabajo pionero para el POT ya que se generó la primera clave de identificación y el primer listado comentado para las especies de cumáceos registradas en dicha área. Asimismo representa el segundo estudio en la costa del Pacífico mexicano, ya que la única investigación previa fue realizada exclusivamente para las costas de Baja California hace más de 20 años.

En general, los cumáceos representan un gran reto para cualquier investigador, ya que el tamaño, la exhibición de especies crípticas así como la carencia de literatura regional especializada, dispersa y en ocasiones de difícil acceso, incrementan el grado de complejidad para el reconocimiento de las especies a nivel local; lo anterior se refleja en el número de especies de cumáceos obtenidos en los muestreos realizados en las provincias de POT, donde es evidente que dichos muestreos han sido esporádicos, no han sido exhaustivos, ni sistemáticos.

Es por ello que con el fin de facilitar la elaboración de trabajos faunísticos del grupo, es necesario continuar realizando estudios de esta índole, en particular en el Pacífico central mexicano, que incluyan no sólo claves de identificación ilustradas, si no también se generen catálogos regionales ilustrados, que sean claros y concisos, con el fin de abrir puertas a futuras investigaciones (biología reproductiva, ecología, biogeografía) que nos permitan conocer plenamente cuál es el papel de este interesante grupo de pequeños crustáceos en el medio ambiente marino.