

A NEW SPECIES OF *EUDACTYLINA*  
(COPEPODA, EUDACTYLINIDAE)  
PARASITIC ON BLACK SHARK FROM CHILE

Ju-shey Ho and Laurie E. McKinney

*Abstract.*—*Eudactylina chilensis*, new species, is described from specimens from the gills of a black shark, *Aculeola nigra* De Buen, collected from Coquimbo, Chile. This is the first record of *Eudactylina* from the southeastern Pacific Ocean.

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*Eudactylina* is a genus of siphonostomatoid copepods found exclusively on the gills of elasmobranchs. This genus comprises 24 nominal species, but none of them are known from the southeastern Pacific Ocean. Only 4 species of *Eudactylina* have been hitherto reported from the Pacific Ocean: *E. acanthii* A. Scott from the Sea of Japan (Gussev, 1951) and the Vancouver Island region (Kabata, 1979), *E. aspera* Heller near Java (Heller, 1868) and Australia (Kabata, 1970), *E. papillosa* Kabata from Australia (Kabata, 1970), and *E. similis* T. Scott off Vancouver Island (Kabata, 1976).

*E. aspera* is the most widely distributed species of *Eudactylina*. In addition to the western South Pacific, where it was first discovered, it has also been reported from the Gulf of Mexico (Bere, 1936; Cressey, 1970), the Indian Ocean near Madagascar (Cressey, 1967), and the Mediterranean off Tunisia (Essafi and Raibau, 1977). The first species of *Eudactylina* from the southeastern Pacific Ocean reported herein is morphologically very close to this widely distributed species of *Eudactylina*.

Specimens of the new *Eudactylina* described below were collected by Prof. Dr. Juan Carvajal of the Instituto de Ciencias Biologicas, Universidad Católica de Chile, Santiago. We are grateful to Prof. Dr. Carvajal for his generosity in placing his collection of *Eudactylina* at our disposal.

*Eudactylina chilensis*, new species

Figs. 1-4

*Material examined.*—29 females and 7 males on gills of *Aculeola nigra* De Buen collected from Coquimbo, Chile during a 5-year (1967-1972) survey of cestodes of Chilean sharks. 6 females and 4 males dissected for studying appendages. Holotype, allotype, and 12 paratypes (10 females and 2 males) deposited in the U.S. National Museum of Natural History, Smithsonian Institution, Washington, D.C.

*Female.*—Body (Fig. 1A) bearing numerous denticles on dorsal and lat-

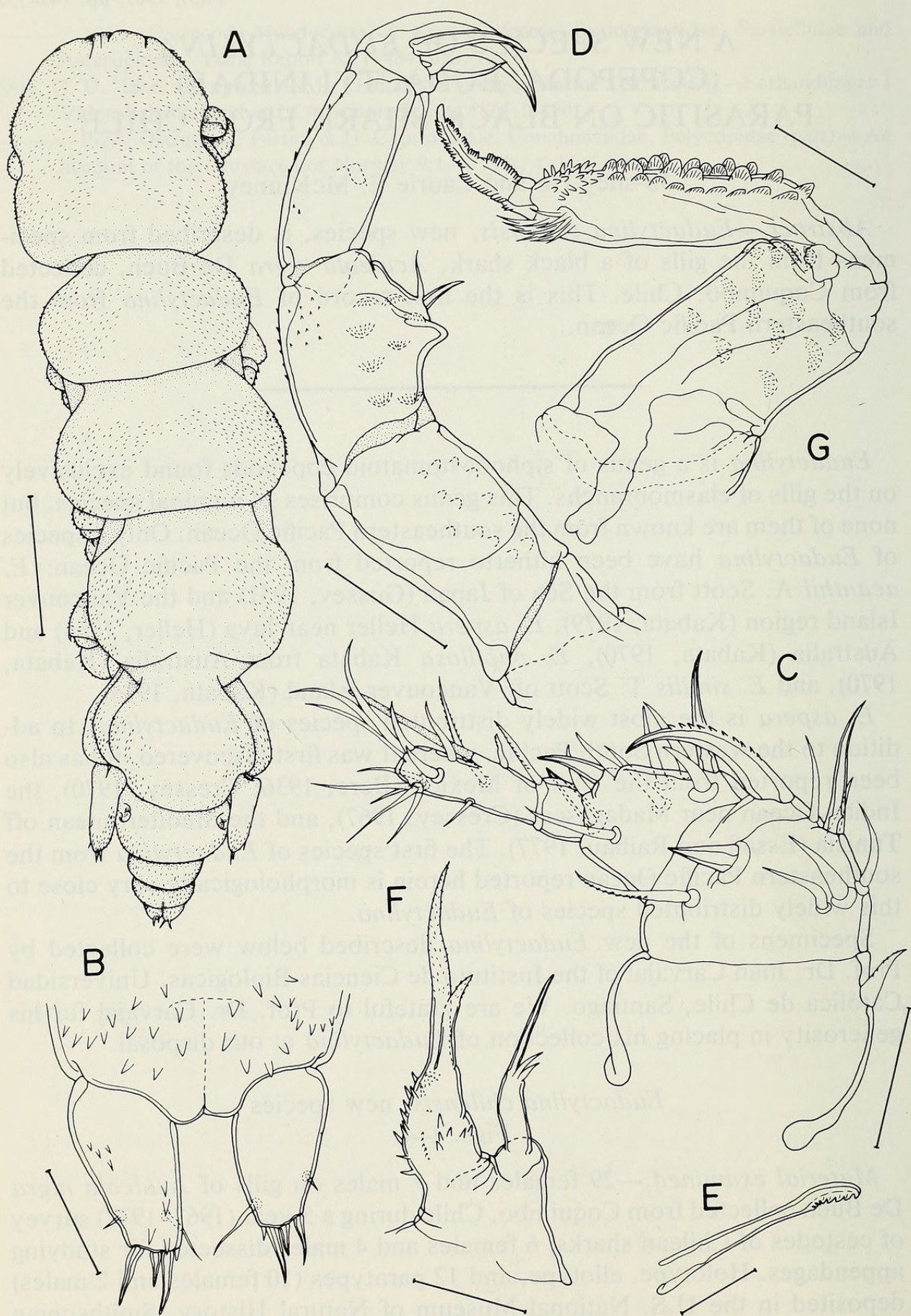


Fig. 1. *Eudactylina chilensis*, female: A, Habitus, dorsal; B, Caudal rami, ventral; C, First antenna, dorsal; D, Second Antenna, lateral; E, Mandible, lateral; F, First maxilla, posterior; G, Second maxilla, outer. Scale: 0.3 mm in A; 0.05 mm in B, C, D, G; 0.03 mm in E; 0.04 mm in F.

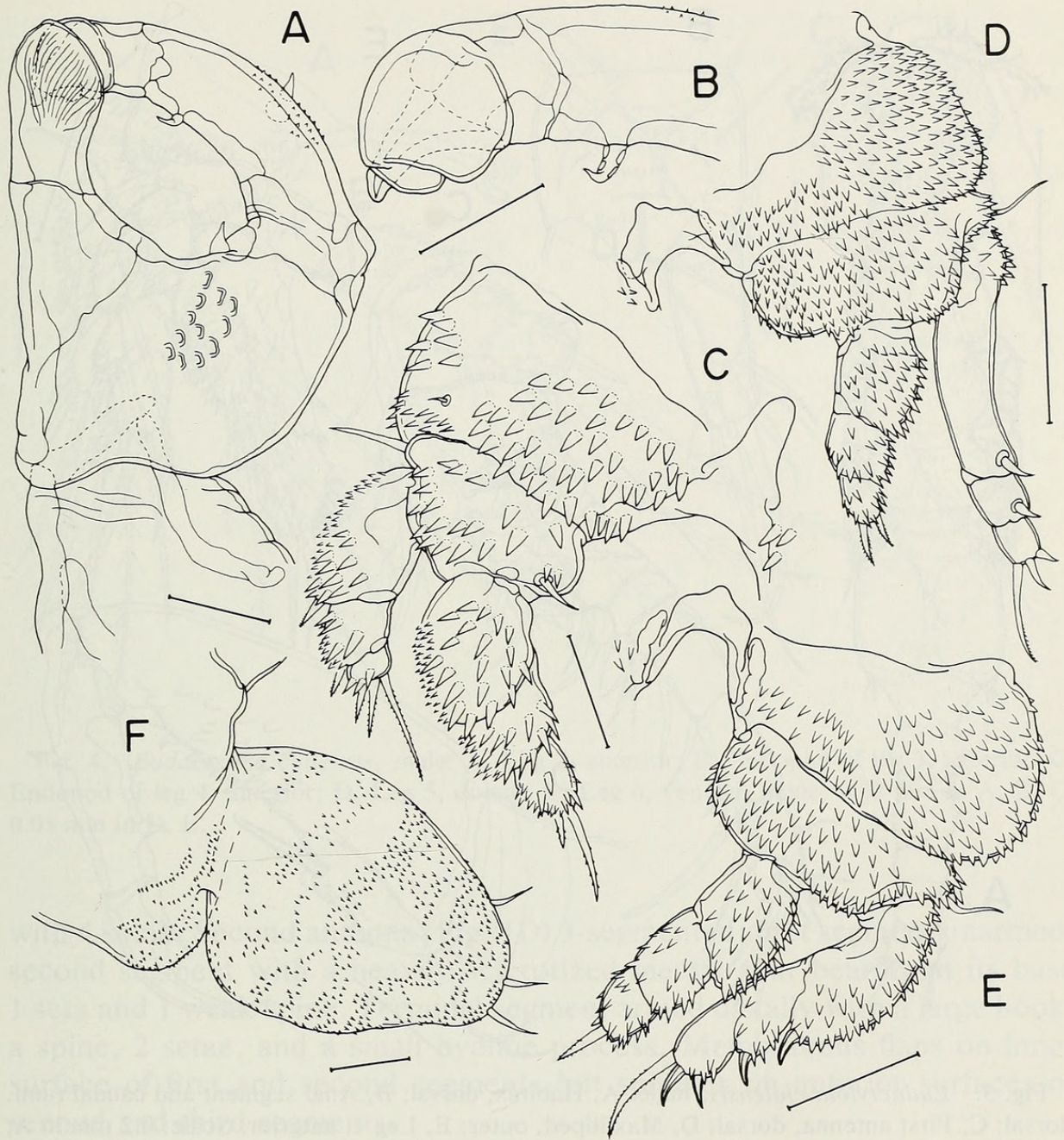


Fig. 2. *Eudactylina chilensis*, female: A, Maxilliped, outer; B, Tip of maxilliped claw, outer; C, Leg 1, anterior; D, Leg 2, anterior; E, Leg 3, anterior; F, Leg 5, outer. Scale: 0.05 mm in A, C, F; 0.04 mm in B; 0.1 mm in D, E.

eral surfaces, particularly of cephalothorax and pedigerous somites. Cephalothorax (containing first pedigerous somite) with a distinct lateral notch. Third pedigerous somite widest, about 356 to 507  $\mu\text{m}$  (average of 10 specimens 420  $\mu\text{m}$ ). Fifth pedigerous somite widely fused with genital segment and bearing a small seta in dorsodistal corner (Fig. 2F). Abdomen 2-segmented, covered sparsely with denticles. Caudal ramus (Fig. 1B) with or without spinules on ventral surface. Dorsal surface bearing subterminal short outer seta and another long inner seta. Distal edge truncate, bearing 3 spines and 1 small inner element. Total length of body 1.64 to 1.99 mm (average of 10 specimens 1.78).

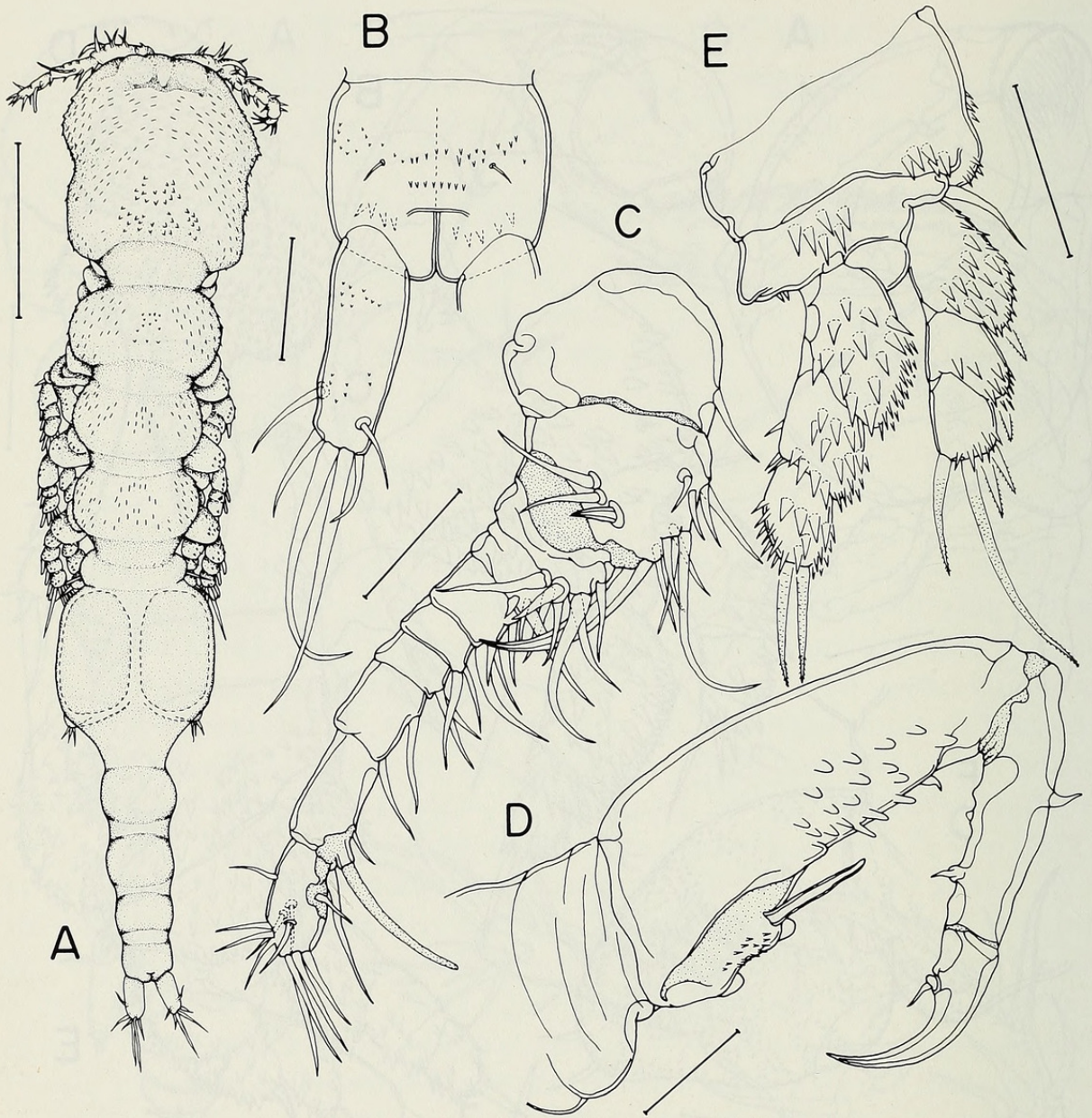


Fig. 3. *Eudactylina chilensis*, male: A, Habitus, dorsal; B, Anal segment and caudal rami, dorsal; C, First antenna, dorsal; D, Maxilliped, outer; E, Leg 1, anterior. Scale: 0.2 mm in A; 0.05 mm in B, C, D, E.

First antenna (Fig. 1C) 5-segmented, with distal 3 segments bending at right angle with 2 robust proximal segments. First segment with 1 spinulose seta on anterior margin. Second segment armed with a strong, curved, and serrated hook at anterodistal corner, a stout spine on dorsal surface, a slender subterminal spine on anterior margin, 1 spinulose seta on dorsal surface and 5 simple setae on anterior surface. Third segment bearing 3 spines and 7 simple setae. Fourth segment with 1 spinulose seta at disto-outer corner. Terminal segment about 3 times longer than wide, with 3 (2 of them spinulose) setae and 1 aesthete near middle region, followed distally by 2 setae on dorsal surface and a group of 5 setae on posterior surface, and tipped

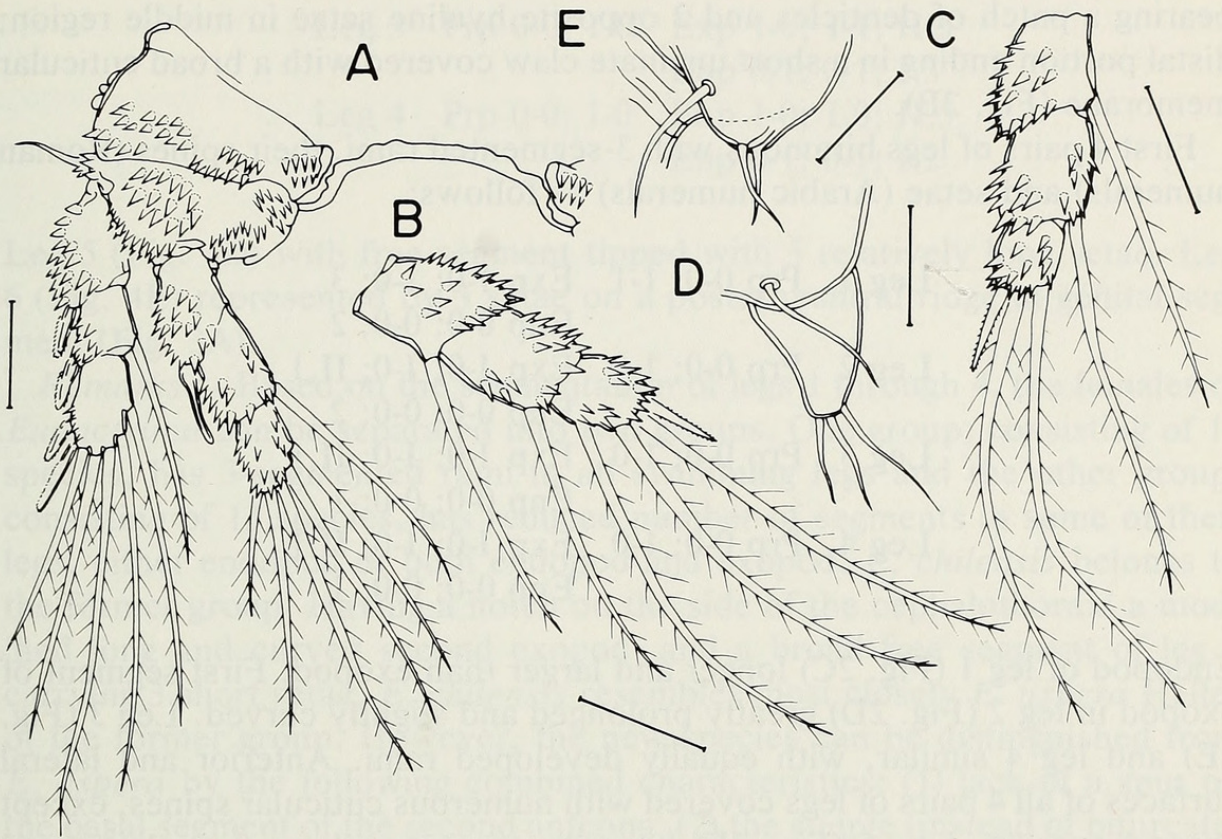


Fig. 4. *Eudactylina chilensis*, male: A, Leg 2, anterior; B, Endopod of leg 3, anterior; C, Endopod of leg 4, anterior; D, Leg 5, dorsal; E, Leg 6, ventral. Scale: 0.05 mm in A, B, C; 0.03 mm in D, E.

with 4 setae. Second antenna (Fig. 1D) 3-segmented; first segment unarmed, second segment with a heavily sclerotized medial spur bearing at its base 1 seta and 1 weak spine. Terminal segment armed distally with a large hook, a spine, 2 setae, and a small hyaline process. Membranous flaps on inner surface of first and second segments but spinules on anterior surfaces of second and third segments.

Mandible (Fig. 1E) with terminal teeth (3 small proximal and 5 large distal). First maxilla (Fig. 1F) biramous, with a denticulate endopod carrying 2 spinulose setae and a slender exopod tipped by 1 long and 2 short setae. Second maxilla (Fig. 1G) 2-segmented; basal segment larger, with membranous flaps on outer surface; terminal segment with rows of membranous flaps on anterior surface, a patch of denticles on anterodistal surface and a cluster of setae on posterodistal surface. Terminal claw nearly half as long as terminal segment, with bilaterally serrate cuticular membrane. Maxilliped (Fig. 2A) a powerful chelate attachment apparatus consisting of 3 segments. Basal segment membranous but reinforced with sclerotized bars. Middle segment largest, with its posterodistal corner protruded to form a receptacle; several cuticular flaps on outer surface and one stout seta on distal margin opposite terminal receptacle. Terminal segment cylindrical and curved,

bearing a patch of denticles and 2 opposite hyaline setae in middle region; distal portion ending in a short uncinete claw covered with a broad cuticular membrane (Fig. 2B).

First 4 pairs of legs biramous with 3-segmented rami, their spines (Roman numerals) and setae (Arabic numerals) as follows:

Leg 1	Prp 0-0; 1-1	Exp 1-0; 1-0; 3 Enp 0-0; 0-0; 2
Leg 2	Prp 0-0; 1-0	Exp I-0; I-0; II, 1 Enp 0-0; 0-0; 2
Leg 3	Prp 0-0; 1-0	Exp I-0; I-0; II, 1 Enp 0-0; 0-0; 1
Leg 4	Prp 0-0; 1-0	Exp I-0; I-0; II, 1 Enp 0-0; 0-0; 1

Endopod of leg 1 (Fig. 2C) longer and larger than exopod. First segment of exopod in leg 2 (Fig. 2D) greatly prolonged and slightly curved. Leg 3 (Fig. 2E) and leg 4 similar, with equally developed rami. Anterior and lateral surfaces of all 4 pairs of legs covered with numerous cuticular spines, except second exopod. Leg 5 (Fig. 2F) laterally compressed, oval, and covered with spinules (more on outer than inner surface); distal margins bearing 3 small setae.

*Male*.—Body (Fig. 3A) similar to female, but more slender and having inconspicuous fifth pedigerous somite and 4-segmented abdomen. Caudal ramus (Fig. 3B) about 2.8 times longer than wide, carrying distally 1 inner seta, 1 outer seta and 4 terminal setae. Total length of body 1.36 to 1.59 mm (average of 7 specimens 1.47); cephalothorax widest, 260 to 343  $\mu\text{m}$  (average of 7 specimens 305).

First antenna (Fig. 3C) 9-segmented, with a robust base composed of first 2 segments. Armature on these segments: 1, 13 (including a short spine and an uncinete spinulose claw), 10, 4, 2, 2, 2, 2 + 1 aesthete, and 12. Second antenna, mandible, first maxilla, and second maxilla as in female. Maxilliped (Fig. 3D) subchelate and 3-segmented. Basal segment small, membranous. Middle segment long, bearing in membranous basal region 2 obtuse protrusions with a patch of spinules between them and 1 long, sturdy spine; distal to these a patch of cuticular spines. Terminal segment cylindrical, with 2 setae and 1 uncinete claw that bears a basal seta.

First 4 pairs of legs (Figs. 3E, 4A–C) biramous and trimerite as in female, but with different armature:

Leg 1	Prp 0-0; 1-0	Exp I-0; I-0; 4 Enp 0-0; 0-0; 2
Leg 2	Prp 0-0; 1-0	Exp I-0; I-1; II, 5 Enp I-0; 0-1; 5

Leg 3	Prp 0-0; 1-0	Exp I-0; I-1; II,5 Enp 0-1; 0-1; I,3
Leg 4	Prp 0-0; 1-0	Exp I-0; I-0; II,5 Enp 0-1; 0-1; I,2

Leg 5 (Fig. 4D) with free segment tipped with 3 relatively long setae. Leg 6 (Fig. 4E) represented by 3 setae on a posteroventral ridge in genital segment (Fig. 3A).

*Remarks.*—Based on the segmentation of legs 1 through 4, the females of *Eudactylina* can be separated into two groups. One group, consisting of 11 species, has 3-segmented rami in all swimming legs and the other group, consisting of 13 species, has reduced number of segments in some of their legs, either endopod or both endopod and exopod. *E. chilensis* belongs to the former group. Having a notch on the side of the cephalothorax, a modified long and curved second exopod, and a broad free segment of leg 5 carrying 3 short setae, *E. chilensis* resembles most closely *E. aspera* Heller of the former group. However, the new species can be distinguished from *E. aspera* by the following combined characteristics: (1) lack of a spur on the basal segment of the second antenna, (2) the simple (instead of bifurcate) terminal claw on the second maxilla, and (3) the caudal ramus being tipped with 3 spines and 1 small spinous seta (instead of 2 tubercles).

The males of *Eudactylina* are rarely found. Up to date, only *E. acuta* van Beneden, *E. alata* Pillai, and *E. similis* T. Scott have records of their males. The male of *E. chilensis* is distinguishable from these 3 males in having 3 segments on both rami of legs 1 through 4 and an armature of II,5 on the terminal segment of the exopod legs 2 through 4.

An unique armature is seen in the male of *E. chilensis* on the basal segment of the second endopod (see Fig. 4A). The presence of this large, blunt, and articulated outer spine is not only unique in the *Eudactylina*, but also in the entire Order Siphonostomatoida.

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Department of Biology, California State University, Long Beach, California 90840.





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