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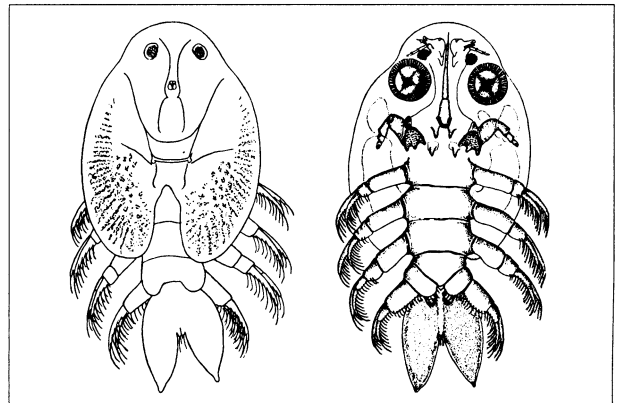
Branchiura (Crustacea) of the Gulf of Mexico

William J. Poly

The subclass Branchiura contains 4 valid genera: *Argulus*, *Chonopeltis*, *Dipteropeltis*, and *Dolops*, within a single family, the Argulidae; however, subfamilies within the Argulidae and the family Dipteropeltidae also have been proposed (Yamaguti 1963). The genus *Dipteropeltis* contains one valid species and occurs in South America; *Chonopeltis* has 14 valid species and is found only in Africa; and *Dolops*, with 13 valid species, has a Gondwanan distribution (South America, Africa, and Tasmania; Fryer 1969), with all but 2 species in South America. Species within the 3 aforementioned genera live in freshwater only. The genus *Argulus* contains about 129 valid species and occurs on or around all continents, except Antarctica, in marine, estuarine, and freshwater habitats. Branchiurans are ectoparasites of fishes and more rarely of amphibians; one species, *Argulus alosae*, has been found on marine invertebrates, and other *Argulus* spp. have been collected in plankton tows (Stuhlmann 1891, Yamaguti 1963, Cressey 1978, Jackson and Marcogliese 1995, Poly 2003).

Argulids have been reported as food items of fishes occasionally (Carr and Adams 1972, Martinez-Palacios and Ross 1988), can serve as intermediate hosts for some nematode parasites of fishes (Molnar and Moravec 1997, Moravec, Vidal-Martínez, and Aguirre-Macedo 1999), and can be vectors of viral disease of fishes (Pfeil-Putzien 1978, Ahne 1985).

Adult female *Argulus* spp. tend to be larger on average than males. On legs 2–4, male *Argulus* spp. usually have modifications that are absent on females. Other differ-



Branchiura. After Wilson 1902.

ences between the sexes include the presence of a pair of testes in the male's abdomen and a pair of spermathecae in the female's abdomen, a greater number of support rods in suction cups (= first maxillae) of females, and also usually a higher number of sclerites in the support rods of females. Shapes of respiratory areas, carapace and abdomen, number of sclerites in suction cup support rods and number of support rods per suction cup, features of the second maxillae (especially basal plate), pigmentation, and secondary sexual characters of males are some of the most useful taxonomic characters for distinguishing species.

Mating takes place on the host fish, and later, the female swims from the host to lay the eggs, which are attached with an adhesive substance to firm substrata such as plants or rocks. Eggs are laid in a monolayer and in distinct patterns such as single long rows, multiple rows

(side-by-side), or in less-ordered clusters, depending on the species. Eggs appear white or light yellow when first laid, but after a day or so they begin to take on a more yellowish coloration and later might even turn brown (Kellicott 1880, Wilson 1902, W. Poly pers. obs.). Further information on the topics of egg laying, embryonic development, hatching, and post-embryonic development and morphology can be found in Jurine (1806), Clark (1902), Wilson (1902), Tokioka (1936), Thomas (1962), Loro (1964), and Rushton-Mellor and Boxshall (1994).

Only estuarine and marine species known from the Gulf of Mexico (GMx) were included in the following discussion. The first argulid to be described from the GMx was *A. funduli*, which was collected near New Orleans (Krøyer 1863), then Wilson (1902) recorded the presence of a second species in the Gulf. Bere (1936) studied argulids and other parasitic Crustacea from the Gulf of Mexico and described 3 new species of *Argulus*. Meehan (1940) and Wilson (1944) each described one new species from single male and female specimens, respectively. Additional records of *Argulus* spp. from Florida, Mississippi, Texas, and Mexico were reported by Pearse (1953), Causey (1955), and Jones and Circe (1977). Recently, a new species was described from the Yucatán Peninsula (Poly 2005), being the seventh species described from sites within the Gulf of Mexico and its estuaries. A total of 10 species of *Argulus* have been reported from the Gulf of Mexico and its estuaries (see taxon summary).

Schmitt's (1954) summary of Copepoda in the Gulf of Mexico included the Branchiura and cited the major works on Argulidae from the Gulf of Mexico and surrounding regions. Since then, Cressey (1972, 1978) provided keys to species occurring in the United States, although several valid species were not included. A thorough taxonomic study of the group has not been published since the works of Wilson (1902) and Meehan (1940); however, the present author is working on a revision now. There have been several reports of unidentified *Argulus* specimens from the Gulf of Mexico, and additional species, especially those known from the Caribbean and from the Atlantic coast of the United States, undoubtedly will continue to be discovered in the Gulf of Mexico. Some published reports of *Argulus* spp. were based on misidentified specimens or require verification, and these were excluded from this discussion. For some published records, voucher material was never deposited into a natural history collection, and thus, cannot be verified. The specimen of *Argulus fuscus* shown on the color plate in this volume is from the Flor-

ida Fish and Wildlife Research Institute Invertebrate Collection, St. Petersburg, Florida (FSBC I).

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Taxonomic summary for Branchiura of the Gulf of Mexico.

Component Taxa	Total species	Species known from GMx only	Nonindigenous species
Branchiura			
Argulidae	10	4	0

Checklist of fishlice (Crustacea: Branchiura) from the Gulf of Mexico.

Taxon	Hosts ¹	Overall geographic range	GMx range	References/Endnotes
Subphylum: Crustacea				
Class: Maxillopoda				
Subclass: Branchiura				
Order: Arguloida				
Family: Argulidae				
<i>Argulus alosae</i> Gould, 1841	<i>Opsanus</i> sp.	Atlantic and Gulf coasts	ese	8, 17, 29
<i>Argulus bicolor</i> Bere, 1936	<i>Strongylura notata</i> , <i>Archosargus rhomboidalis</i> (species originally given as <i>A. unimaculatus</i>), <i>Trachinotus carolinus</i>	Atlantic and Gulf coasts	ene, wnw	2, 11
<i>Argulus floridensis</i> Meehan, 1940	host unknown	Gulf coast	ese	17
<i>Argulus funduli</i> Krøyer, 1863	<i>Fundulus</i> sp.	Gulf coast	nne	14
<i>Argulus fuscus</i> Bere, 1936	<i>Orthopristis chrysoptera</i> , <i>Bairdiella chrysooura</i> , <i>Trachinotus carolinus</i>	Atlantic and Gulf coasts	ene	2 ²
<i>Argulus laticauda</i> Smith, 1873	<i>Paralichthys lethostigma</i> , <i>Ariopsis felis</i> (given originally in genus <i>Galeichthys</i>), <i>Dasyatis sabina</i>	Atlantic and Gulf coasts	nne	5, 17, 20
<i>Argulus megalops</i> Smith, 1873	<i>Opsanus tau</i>	Atlantic and Gulf coasts	ese, nne	20
<i>Argulus rotundus</i> Wilson, 1944	host unknown	Gulf coast	unknown	30
<i>Argulus varians</i> Bere, 1936	<i>Lagodon rhomboides</i> , <i>Echeneis naucrates</i> , <i>Ogcocephalus nasutus</i> , <i>Ogcocephalus</i> sp., <i>Chilomycterus schoepfii</i> , <i>Chilomycterus spinosus</i>	Atlantic and Gulf coasts	ene	2, 20 ³
<i>Argulus yucatanus</i> Poly, 2005	<i>Cichlasoma urophthalmus</i>	Gulf Coast	sse	19, 23

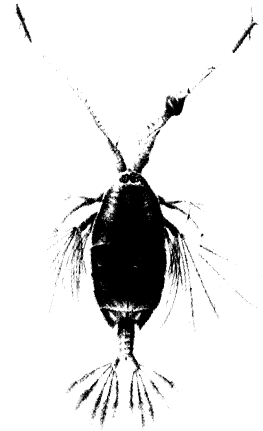
¹ List of hosts refers only to records from the Gulf of Mexico, even if other host records exist for the species along the Atlantic coast.

² This is the first Atlantic coast record of *A. fuscus* (FSBC I 18894; 1 female, Indian River near Melbourne, Brevard County, Florida, 14 September 1971, coll.: Dale S. Beaumariage) and is the specimen shown in the color plate in this volume. It had been previously identified as *A. megalops*. Thanks to Sandra L. Farrington for the loan of the specimen.

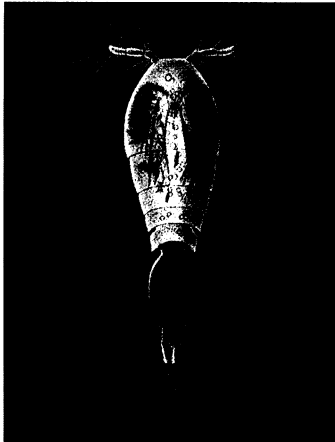
³ Bouchet (1985) provided a redescription of this species using specimens collected from Biscayne Bay (Atlantic coast of Florida).



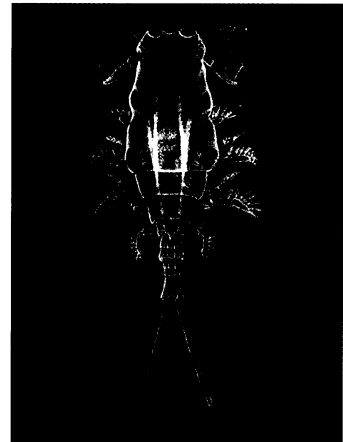
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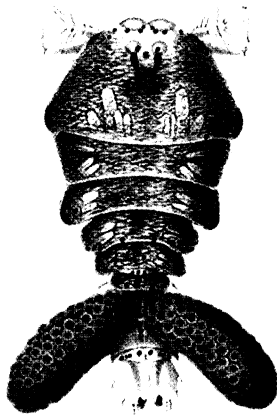
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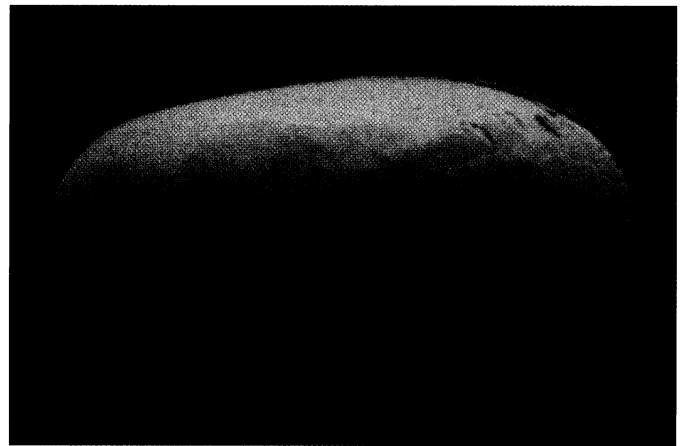
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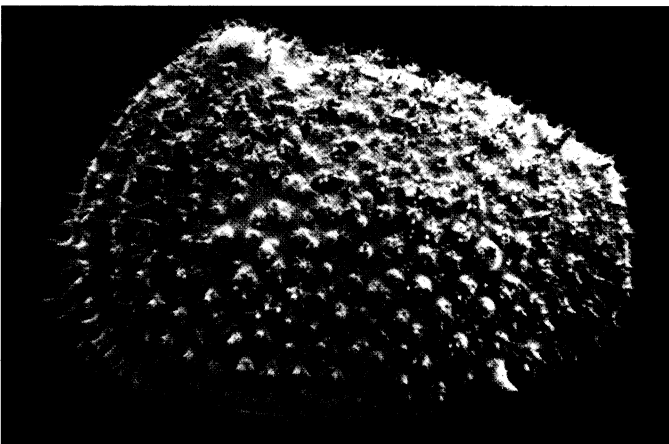
(d)



(e)



(f)



(g)

- 20 (a) Branchiuran, *Argulus fuscus*, described from the Gulf of Mexico; specimen from Indian River, eastern Florida (photograph by W. Poly)
- (b) Copepod, *Pontellina plumata*, hand-painted plate by Giesbrecht (1893) (scanned by C. Walter)
- (c) Copepod, *Oncaea venusta*, hand-painted plate by Giesbrecht (1893) (scanned by C. Walter)
- (d) Copepod, *Copilia vitrea*, hand-painted plate by Giesbrecht (1893) (scanned by C. Walter)
- (e) Copepod, *Sapphirina auronitens*, hand-painted plate by Giesbrecht (1893) (scanned by C. Walter)
- (f) Podocopan ostracod, *Saipanetta kelloughae*, West Flower Garden, right lateral view of whole carapace, magnification $\times 192$ (SEM micrograph by R. Maddocks)
- (g) Podocopan ostracod, *Echinocythereis margaritifera*, R. Maddocks specimen number 1291, female left valve exterior lateral view, magnification $\times 110$, RV *Gyre* cruise 74-G-11 Station 5A, $28^{\circ} 19.5'N$, $94^{\circ} 09.0'W$, 50 m depth, northwestern Gulf of Mexico. Raw scan of Polaroid SEM image (SEM micrograph by R. Maddocks)

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Cover: The orange-cup coral, *Tubastraea coccinea* Lesson, 1829. The beautifully delicate live polyps featured here represent a nonindigenous species of current concern, exemplifying the urgent need for the biodiversity baseline provided in this volume. Native to the Indo-Pacific region, this species has been introduced into the Western Atlantic and the Gulf of Mexico by the activities of man (Global Invasive Species Database, www.issg.org/database). Photograph by Harley Moody.

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