A new Species of *Mugilicola* Tripathi (Copepoda: Poecilostomatoida) and a Review of the Family Therodamasidae

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A new species of *Mugilicola* is described from the gills of *Sillago ciliata* caught off the coast of New South Wales. *Mugilicola* and *Paeonodes* are closely related but neither exhibits the same tagmosis as *Therodamas*, the type genus of the family Therodamasidae to which all three genera have been referred. There is no apparent justification for retaining the Therodamasidae as a separate family since these genera can be regarded as highly transformed representatives of the Ergasilidae.

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INTRODUCTION

The genus *Mugilicola* was established by Tripathi (1960) to accommodate a copepod parasite of two species of *Mugil* from India. Tripathi placed *Mugilicola* in a new family, the Therodamasidae, based on the genus *Therodamas* Krøyer, 1863. This family is closely related to the Ergasilidae, as recognized by Thomsen (1949) and Tripathi (1960). Cressey (1972), in his discussion of the genus *Therodamas*, suggested that it might be accorded subfamilial separation within the family Ergasilidae. Hewitt (1969) enlarged the Therodamasidae by the transfer of the genus *Paeonodes* Wilson, 1944. *Paeonodes* and *Mugilicola* share the same tagmosis and are closely related but their relationship with the type genus, *Therodamas*, is slight. The discovery of a third species of *Mugilicola* from Australia stimulated this review of the family.

MATERIALS AND METHODS

A single female was collected from the gills of a whiting, *Sillago ciliata* Cuvier & Valenciennes, 1829, caught off Arrawarra Beach, New South Wales, Australia. The specimen was part of an extensive collection made by Klaus Rohde (University of New England, Armidale) from fishes of southeastern Australia. The holotype ♀ is deposited in the collections of the British Museum (Natural History), Reg. No. 1984.189. The specimen was dissected and examined in lactophenol. Drawings were made using an Olympus BH-2 microscope and drawing tube.

Mugilicola australiensis new species

Description: Body of adult female (Fig. 1**A**) highly transformed and lacking any obvious external segmentation. Head small, widest posteriorly but without cephalic lobes. Neck long and slender comprising over 60 per cent of the total body length and merging imperceptibly with the broader trunk. Trunk bearing first legs just posterior to its midlevel, legs 2 and 3 on its posterior surface (Fig. 1**B**). Small urosome (Fig. 1**C**) consisting

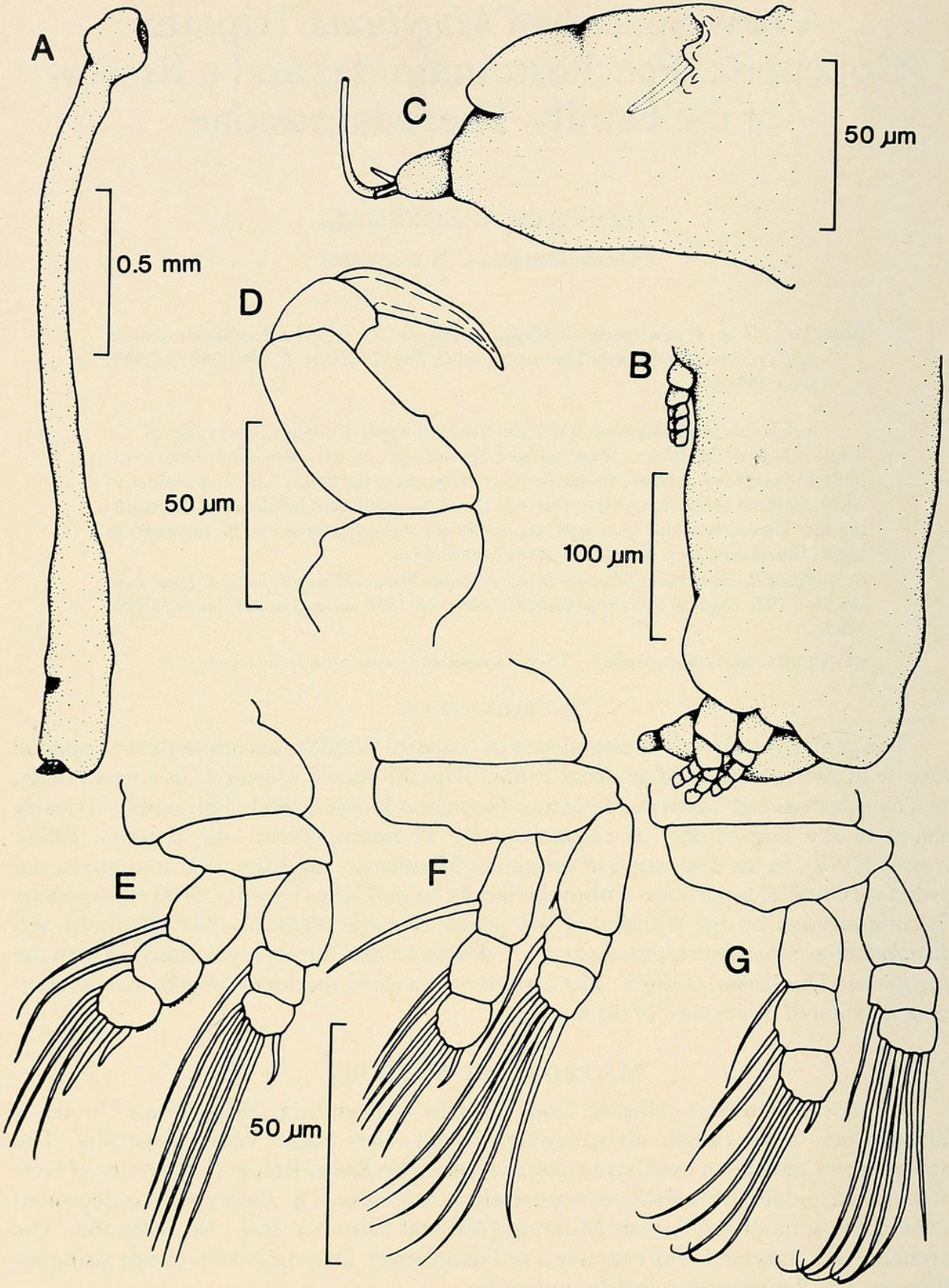

Fig. 1. Mugilicola australiensis, holotype female. **A**, Dorsal. **B**, Posterior end of trunk, lateral. **C**, Urosome, lateral. **D**, Antenna. **E**, Leg 1. **F**, Leg 2. **G**, Leg 3.

of the fused genital complex and a single abdominal segment which bears the caudal rami posteriorly. Urosome directed posteroventrally (Fig. 1**B**) and largely concealed by

posterior leg pairs, although this may be a fixation artifact. Armature of caudal rami damaged but comprising at least 3 setae. Total length of holotype ♀ 2.38 mm.

The head of the holotype is damaged and, of the cephalic appendages, only the antenna is intact. Antenna (Fig. 1**D**) subchelate, first segment unarmed, second segment bearing a small process on inner margin, third segment carrying terminal claw. Legs 1-3 biramous, with 3-segmented rami (Figs 1**E-G**); armature formula as follows:

	coxa	basis	endopod	exopod
leg 1	0-0	0-0	0-1;0-1;0,II,3	0-0;0-1;0,I,5
leg 2	0-0	0-0	0-1;0-2;0,I,4	0-0;0-1;0,1,5
leg 3	0-0	0-0	0-1;0-2;0,I,4	0-0;0-1;0,1,5

Terminal armature element on third exopod segment of legs 2 and 3 setiform. Legs 4 and 5 absent. Leg 6 forming an unarmed plate serving to close each genital aperture.

Etymology: The specific name, *australiensis*, is derived from the type-locality.

Remarks: The new species can be distinguished from its congeners by its general facies. It differs from *M. smithae* Jones and Hine, 1978 in the shape of its head, *M. smithae* being provided with trilobate posterolateral processes on its head. It differs from *M. bulbosus* Tripathi, 1960 in having a relatively longer and narrower neck and in the relatively small size of its urosome. These three species also show differences in the armature of their swimming legs. *M. bulbosus* and the new species have 2 setae on the second endopod segment of leg 2 whereas *M. smithae* apparently has only one. There may, however, be an error in the labelling of the legs in Jones and Hine (1978) as it is very unusual in copepods in general for leg 2 to have only 1 seta on this segment when legs 1 and 3 have 2 setae. *M. bulbosus* has one armature element less on the apex of the endopod of all three legs than the new species. *Mugilicola* species can be distinguished from *Paeonodes* species by the number of swimming legs, 3 in the former and 4 in the latter.

Discussion

The genera *Mugilicola, Paeonodes* and *Therodamas* all possess mouthparts of the basic ergasilid type (see Tripathi, 1960; Hewitt, 1969; Cressey, 1972). The mandible is falcate with a reduced palp, the maxillule is a lobe bearing 2 setae, and the maxilla is two-segmented with the second segment armed with many small spinules. The maxilliped is absent in the adult female. The antennule is 5-segmented in all three genera. The antenna has 3 segments plus a terminal claw in *Mugilicola* and *Paeonodes* but in *Therodamas* the 3 segments are fused into a single robust basal segment bearing the terminal claw. The swimming legs are biramous in all three genera but *Mugilicola* has only 3 pairs rather than 4. Apart from the derived condition of the antenna in *Therodamas* all of these characters occur within the Ergasilidae.

Therodamas, Mugilicola and *Paeonodes* differ in tagmosis from all the genera included in the Ergasilidae by Kabata (1979) in their possession of a long neck. It was this character more than any other upon which Tripathi (1960) based the family Therodamasidae. However, the neck of *Therodamas* is not homologous with that of *Mugilicola* and *Paeonodes*. The neck of the latter two genera is postcephalic in origin whereas that of *Therodamas* is cephalic, separating the antennae from the oral region (Cressey, 1972). The common possession of a postcephalic neck is a synapomorphy between *Mugilicola* and *Paeonodes*.

The possession of typical ergasilid cephalic appendages and the lack of a maxilliped in the adult female are the diagnostic apomorphies of the family Ergasilidae. These characters are sufficient to place *Therodamas, Mugilicola* and *Paeonodes* in that family. They are highly derived mesoparasitic representatives of a family which typically

contains ectoparasitic forms but there is no apparent justification for their separation at the familial level.

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