

AMATERASIA AMANOIWATOI NOV. GEN., NOV. SP. (COPEPODA,  
SIPHONOSTOMATOIDA, AMATERASIDAE NOV. FAM.), WITH  
GALL-FORMING JUVENILES PARASITIC ON THE FINS OF  
A BALISTID ACTINOPTERYGIAN FISH

BY

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ABSTRACT

A parasitic copepod, *Amaterasia amanoiwatoi* nov. gen., nov. sp. (Siphonostomatoida, Amaterasidae nov. fam.) is described together with its juveniles, including the copepodid stages, based on specimens recovered from galls formed on the fins of the fish, *Xanthichthys lineopunctatus* (Hollard, 1854), taken off Clarion Island, eastern Pacific, in 1957. This species resembles pandarid copepods, but is distinct in some characteristic features. It has gall-forming juveniles in its life cycle, which are referred to here as encysted copepodid stage. An advanced encysted copepodid 5 yielded an adult female developing inside it, on which the description of this new species is based. The encysted copepodid encysts and lodges inside a gall, with its caudal rami extending partly beyond the posterior orifice of the gall. All stages found probably are females. The encysted copepodid ingests exudates from the host through a ventral hole in the cyst wall. The encysted copepodid 1 is compared with caligid and pandarid copepodids. Some speculations are made on the possible life history of this species.

RÉSUMÉ

Un copépode parasite, *Amaterasia amanoiwatoi* nov. gen., nov. sp. (Siphonostomatoida, Amaterasidae nov. fam.) est décrit ainsi que ses stades de développement, incluant les stades copépoditiques, à partir de spécimens obtenus de galles formées sur les nageoires du poisson *Xanthichthys lineopunctatus* (Hollard, 1854), pris en 1957 au large de l'île Clarion, Pacifique oriental. Cette espèce ressemble aux copépodes pandarides, mais s'en distingue par certains traits caractéristiques. Il présente, au cours de son cycle de vie, des stades juvéniles formant des galles, qui sont désignés ici comme stade copépoditique enkysté. Un copépodite 5 enkysté avait produit, à l'intérieur du kyste, une femelle adulte à partir de laquelle est fondée la description de cette nouvelle espèce. Le copépodite s'enkyste et loge à l'intérieur de la galle, avec ses rames furcales dépassant de l'orifice postérieur de la galle. Tous les stades trouvés sont probablement femelles. Le copépodite enkysté ingère les exsudats de l'hôte à travers un "trou" ventral de la paroi du kyste. Le copépodite enkysté 1 est comparé aux copépodites de caligides et de pandarides. Des hypothèses sont proposées sur l'histoire possible de la vie de cette espèce.

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## INTRODUCTION

Gall-forming parasitic copepods of fishes are known from the poecilostomatous Cyclopoida, such as *Sarcotaces* Olsson, 1872 and *Ichthyotaces* Shiino, 1932 of the family Philichthyidae Vogt, 1877. However, no representative was known in the Siphonostomatoida. The new species dealt with here is the first example from this order. Specimens on which this study was based were recovered from galls formed on the dorsal or anal fins of a balistid actinopterygian, *Xanthichthys lineopunctatus* (Hollard, 1854), taken by W. L. Klawe (La Jolla, California) of the Inter-American Tropical Tuna Commission off Clarion Island, in the eastern Pacific, Mexico in 1957 and sent to S. M. Shiino (Tsu, Mie) for identification. Shiino removed several copepods from the galls and began to examine them. His study, however, was left unfinished, except for some drawings and notes from the examination.

This species is unique in that only the female apparently develops via gall-forming juveniles, which are referred to here as the encysted copepodid stage, which encysts forming a gall. The encysted copepodids lack the frontal filament. In the present paper, this species is described based on a female developing inside an advanced encysted copepodid 5; the description also includes the encysted copepodid stages 1 and 3-5. The species resembles pandarid copepods, but differs distinctly from these. The encysted copepodid 1 is compared with caligid and pandarid copepodids. Speculations on the life history of this species are presented.

## MATERIAL AND METHODS

A total of 103 complete specimens was examined. They were recovered from galls in the dorsal or anal fins of *Xanthichthys lineopunctatus* (Tetraodontiformes, Balistidae), which was taken by W. L. Klawe of the Inter-American Tropical Tuna Commission off Clarion Island, Revillagigedo group, Mexico, in the eastern Pacific, on 7 July 1957. The adult female described here is based on an individual developing inside an advanced encysted copepodid 5 stage. Specimens preserved in alcohol were stained with chlorazol black E in lactic acid and examined with a differential interference contrast microscope using the wooden slide method of Humes & Gooding (1964). Drawings were made with the aid of a drawing tube. The terminology is based on Kabata (1979) and Huys & Boxshall (1991). The specimens will be retained in our laboratory (IMBL S-397), until finally deposited in the USNM collections at the Smithsonian Institution, Washington, D.C.

## PARASITIC MODE OF THE ENCYSTED COPEPODID

The galls are tear-drop shaped and brownish in colour. They are attached to the fin membrane with their body lying parallel to the fin rays and are distributed