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## ECTOPARASITES OF THE WESTERN ROACH FROM TWO FOOTHILL STREAMS

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**Abstract:** Sixty-eight western roach, *Hesperoleucus symmetricus symmetricus*, from two foothill streams east of Fresno, California were examined for ectoparasites. Results of the limited survey showed nine new records for ectoparasite species for roach. Four species of protozoa, *Trichodina* sp., *Glossatella* sp., *Ichthyophthirius multifiliis*, *Myxobolus* sp., one species of monogenetic trematode, *Urocleidus* sp., three species of copepods, *Lernaea bagri*, *L. piscinae* and *Lernaea* sp. and the Hirudinean, *Piscicola punctatus*, represent the new records. Morphological characteristics and mensural data for *Trichodina* sp. and *Glossatella* sp. indicate these protozoa may be new species. Each roach was host to at least one species of ectoparasite. One fish harbored five species of parasites, while the average number of parasite species per fish was 2.5.

### INTRODUCTION

The Western roach, *Hesperoleucus symmetricus symmetricus*, (Baird and Girard) is a rather obscure native cyprinid inhabiting small foothill streams of the Sacramento-San Joaquin River drainage.<sup>1</sup> The fish rarely exceeds 12.7 cm in length and has never had commercial value, even as a bait minnow. It is perhaps because of this economic unimportance that the parasite record of the roach, as well as many other foothill fishes, is incomplete.

In the first published survey of roach parasites, Haderlie<sup>2</sup> reported finding the nematode *Cystidicola* sp., the metacercaria of *Posthodiplostomum minimum* and the indefinite metacercaria he called *Neascus* sp. Mizelle, and Price<sup>3</sup> described a new species of monogenetic trematode, *Dactylogyrus occidentalis*, found on the gills of a roach from Webber Creek in northern California. These two accounts are the only known results of general parasitological surveys.

The objective of this study was to investigate the ectoparasites of the Western

roach collected from two foothill streams in Fresno County. It was designed to add to the known records for this fish species. This information will be useful in understanding sources of ectoparasites in wild fish populations. Disease outbreaks in commercial, state or federal fish hatcheries have been traced to nearby wild fish populations or to the introduction of wild fish to new habitats.

### METHODS

Forty-six western roach, ranging from 3.30 to 11.68 cm in total length, were collected from Watts Creek near the Watts Valley Road bridge approximately 56.3 km east of Fresno on February 23, 1972. Twenty-two specimens, ranging from 4.80 to 9.14 cm in total length were collected from Mill Creek near the Wonder Valley Road bridge 8.0 km southeast of Piedra on March 8, 1972. These are two of the many intermittent streams which drain the foothills east of Fresno. Fish were collected by seining. Fish from Watts Creek were held in a

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cement fish pond at the back of a Fresno home. The pond had been drained and disinfected with bleach before the fish were introduced. No other species of fish were introduced. The fish from Mill Creek were isolated in aquaria at the California State University at Fresno.

Each fish was first examined for copepods and leeches which were removed, preserved in 10% formalin, and examined as whole mounts. Each roach was then killed and scrapings were immediately taken from the body surface, fins and gills. The gills were also examined whole. The scrapings were placed on slides with a drop of water to prevent dessication. Each scraping was examined for live parasites under the microscope. Methyl green-pyronin Y was added to slides in which no parasites were evident, after which each slide was re-examined. Slides with protozoan parasites were fixed and stained with Geisma and by Klein's silver nitrate method. Monogenetic trematodes were teased from the gill filaments and affixed to clean glass slides using the method described by Mizelle.<sup>6</sup> The technique was modified by using increasing alcohol series and eosin stain. Representative gills were fixed in formalin and prepared by standard histological methods utilizing hematoxylin and eosin.

Photographs were taken of all new records. The photographs were numbered and recorded on cards along with species of fish, total length, sample number, date collected, date sacrificed, parasites found, location of parasites, number of parasites, and slide number.

## RESULTS AND DISCUSSION

During the course of the study, nine new parasites (Table 1) were discovered on the roach.<sup>8</sup> Fish harbored as many as five species of parasites, with two to three species per fish an average figure. One of these, *Trichodina*, was found to be a new species and is partially described below. A more complete description of this ciliated protozoan will be the object of another article. Another protozoan, *Glossatella*, also appears to be a

new species. A description of this parasite is given below, but a more detailed study must be undertaken before a complete description can be given. In addition to these new records, the appearance of *Dactylogyrus occidentalis* was confirmed.

*Trichodina* sp. was found on twelve fish from Watts Creek and three fish from Mill Creek. All measurements were based on 38 preserved specimens except body diameter which was based on 7 specimens. The trichodinid has a small, disc-shaped body 34 (27-44) microns in diameter with the following characteristics; cup-shaped adhesive disc, 26 (18-33) microns in diameter, denticular ring 16 (11-20) microns in diameter, denticular number 25 (21-28). This species most nearly resembles *Trichodina tumefaciens*,<sup>8</sup> but differs in having a much smaller adhesive disc and denticular ring.

*Glossatella* sp., found on 9% of the examined roach, may represent a new species. Speciation of the genus *Glossatella* has been accomplished using fairly inflexible measurements as key characteristics. Many authors have proposed that the shape and size of *Glossatella* changes during its life cycle. Therefore, even though measurements of this parasite differ substantially from those reported by others,<sup>1,3,5</sup> it is not known whether this represents a new species or a stage in the life cycle of a previously described species. A more intensive study will be made to more clearly understand the taxonomy of this species. The specimens found on the roach are comparatively large members of the genus *Glossatella*. The species is distinctly banded with a spiral of ciliary rows and has a very definite girdle two-thirds of the way up from the scopula. The macronucleus is large and triangular to subspherical. The micronucleus is almost indistinguishable. Measurements are based on 11 specimens and are given in microns: body length 80 (65-98), body width (at widest point) 40 (35-48), macronucleus length 27 (17-35), macronucleus width 18 (13-23), scopula width 14 (10-18), and body width at anterior end 29 (21-38).

TABLE 1. Parasites of 46 Western Roach from Watts Creek and 22 Western Roach from Mill Creek.

Parasite	Number of Fish infected		Location of Parasite	Percent Infected	
	Watts Creek	Mill Creek		Watts Creek	Mill Creek
Protozoa:					
<i>Trichodina</i> sp.	12	3	Gills, body surf.	26.1	13.6
<i>Glossatella</i> sp.	4	2	Gills, body surf.	8.7	9.1
<i>Ichthyophthirius multifiliis</i>	0	2	Gills, body surf.	0	9.1
<i>Myxobolus</i> sp.	1	0	Gills	2.2	0
Trematoda:					
(Monogenea)					
<i>Urocleidus</i> sp.	46	20	Gills	100.0	90.9
<i>Dactylogyrus occidentalis</i> <sup>Ⓔ</sup>	17	10	Gills	37.0	45.5
Copepoda:					
<i>Lernaea bagri</i>	1	0	Body surf. near pectoral fins	2.2	0
<i>Lernaea piscinae</i>	1	0	Body surf. near pectoral fins	2.2	0
<i>Lernaea</i> sp.	1	0	Body surf. near pectoral fins	2.2	0
Hirudinia:					
<i>Piscicola punctatus</i>	11	5	Fins	23.9	22.7

<sup>†</sup> Not a new record

*Glossatella* was found on roach from both streams. It was found in great abundance on both the gills and external surface of all fish that it parasitized. On the external surface, specimens of *Glossatella* were seen attached directly to the scales.

All of the roach studied were infected with at least one species of parasite. *Urocleidus* was the most abundant parasite found. It was found on the gills of all but two of the roach collected. *Piscicola punctatus* was found on all fish. It

was not uncommon to find four or five of the leeches attached to a single roach. The leeches seemed to prefer the caudal and pelvic fins as places for attachment. The three species of *Lernaea* were found on only one roach from Watts Creek.

One of the new parasite records, *Ichthyophthirius multifiliis*, a ubiquitous ciliated protozoan, is considered a very serious pathogen of wild and commercial fishes.<sup>3</sup> It is the most devastating of all parasites affecting catfish.

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