

## THE TREMATODES OF THE BASILISK LIZARD FROM TABASCO, MEXICO<sup>1</sup>

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### INTRODUCTION

From June through August, 1958, and from January through June, 1959, field collections of trematodes from reptiles were made in the state of Tabasco, Mexico. Most of the reptiles were obtained in the Municipio de Jalapa, near the Teapa river at about 15 miles south of Villahermosa.

Among the reptiles examined were 28 specimens of *Basiliscus vittatus* Wiegmann. Two species of Plagiorchiid trematode were encountered in this host. As far as could be determined, only one of these (*Paralopharynx arctus* Caballero, 1946) has been reported previously from the Basilisk lizard.

### MATERIALS AND METHODS

Trematode specimens were killed with gentle heat, fixed in alcohol-formalin-acetic acid solution, stained with Mayer's carmalum, and cleared in methyl salicylate. Serial sections were prepared by using standard haematoxylin-eosin techniques.

<sup>1</sup> This report is taken from a dissertation submitted to Louisiana State University in partial fulfillment of the requirements for the degree of Doctor of Philosophy.

Representative collections of reptile hosts were fixed in 10% formalin and preserved in 85% alcohol for later determination.<sup>2</sup>

All measurements given in the present paper are in millimeters.

Family PLAGIORCHIDAE Luehe, 1901, emend. Ward, 1917.

Subfamily *Astiotrematinae* Baer, 1924.

*Paralopharynx arctus* Caballero, 1946

Pl. I (Figs. 1, 2 & 3) Pl. II (Figs. 1 & 2).

Host: *Basiliscus vittatus* Wiegmann

Location: Upper intestinal tract.

Geographic range: Guatemala and Nicaragua (Central America); and Tabasco, Mexico (North America.)

In 1946 Caballero described this genus and species based on a single specimen from the basilisk lizard taken in Guatemala. In 1961 Neiland re-described the species, also on the basis of one specimen, from an iguanid lizard obtained in Nicaragua. Additionally, Brenes, Arroyo, and Gei (1960) have described *Paralopharynx gonzalezi* from *Basiliscus* sp. and *Ctenosaura similis* in Costa Rica.

Present material consists of 16 whole mounts of entire worms, whole mounts of fragments of 4 additional specimens, and 2 individuals serially sectioned. These specimens came from 10 infections in which from 1 to 4 worms were encountered per infection. Studies of this series showed that the Tabasco material was closely similar to the original description of *P. arctus* in regard to general size and shape of the body and in the position and structure of the reproductive organs. These facts, plus the common host, led to the conclusion that the specimens from Tabasco were conspecific with Caballero's species.

In studying the series, certain morphological features came to light that had not been reported in the original description. Most notable among these was the presence of two wing-like projections from the antero-ventral margin of the oral sucker. Other undescribed features were the presence of cuticular spination and striking variability in the distribution of vitelline follicles. It was observed that the oral lappets were only visible in some of the specimens in the

<sup>2</sup> The 1958 collection of reptile hosts was determined by Dr. Edward Taylor of the University of Kansas, and the 1959 collection was identified by Dr. Hobart Smith of the University of Illinois.

series. Sections through the lappets showed them to be muscular, hence, it was thought that in some of the specimens these structures were contracted to the extent that they were not visible. Similarly, the cuticular spines were present in some specimens but absent from others. This is not surprising as spines are known to detach readily,

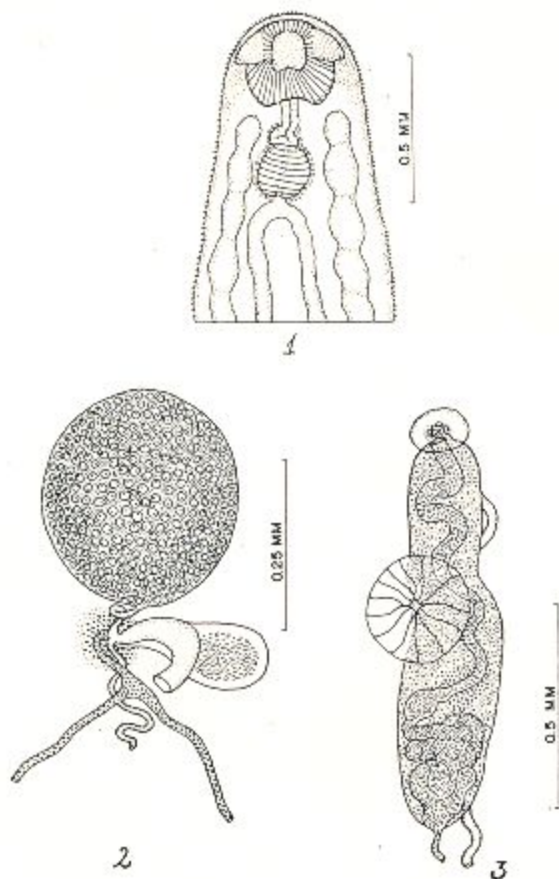


Plate 1. *Parallopharynx arctus* Caballero, 1946: figure 1, anterior extremity showing oral lappets, prepharynx, and pharyngeal glands; figure 2, female genital complex; figure 3, cirrus, cirrus sac, metraterm, and genital atrium.

and in some cases they are suspected of being deciduous. It was therefore presumed that these characters were absent from the holotype. Neither were these features reported in Neiland's redescription nor in the paper by Brenes et al.

Consequently, five preparations from the series were sent to Professor Caballero along with a request that he compare them with the holotype. He very kindly made the comparison, and he expressed complete concurrence with my views (personal communication of December 28, 1960.) Professor Caballero suggested that since the several characters did not occur on the type specimen a redescription of the species and an emendation of the generic description should be prepared. These are included herein. The five whole mount preparations have been deposited in the helminthological collections of the Laboratorio de Helminología at the Instituto de Biología of the Universidad Nacional Autónoma de México where they have been registered under number 218-1.

In the description of *P. arctus*, given below, the size ranges are listed in millimeters. After each size range, the size listed in the original description is included in parentheses.

Description: The body is narrow, highly attenuated, and flattened dorso-ventrally. The cuticle is thin and contains small spines embedded in it anteriorly. The spines are longer near the anterior extremity and become progressively shorter posteriorly. These spines cover only the anterior one-fourth of the body. The body is 8.8 - 14.20 (11.34) long by 0.488 - 1.22 (1.115) wide. The oral sucker bears two antero-ventral lappets which project laterally. These vary in apparent size with the state of contraction. In no specimen of the series do they project beyond the lateral margin of the body. The oral sucker measures 0.23 to 0.303 (0.315) long by 0.252 to 0.33 (0.328) wide. The prepharynx is long and near its entrance into the pharynx the walls are heavy and muscularized. The prepharynx measures 0.165 long by 0.127 wide (0.105 x 0.210.) The prepharynx was measured in a specimen that had the anterior end moderately extended. In specimens having the anterior end contracted the prepharynx appeared wider than long as in the original description. The acetabulum is nearly spherical and measures 0.19 to 0.252 long (0.223) by 0.165 to 0.252 wide (0.227.) The pharynx measures from 0.152 to 0.252 in length (0.239) by 0.14 to 0.213 in width (0.231.) The oesophagus is quite short.

The anterior testis is 0.42 to 0.62 (0.340) long by 0.28 to 0.50 (0.435) wide. The posterior testis is 0.445 to 0.89 (0.378) in length by 0.318 to 0.82 (0.472) in width. The cirrus sac is quite large being 1.65 to 2.30 (0.966) long by 0.165 to 0.19 (0.189)

wide. The ovary measures 0.19 to 0.38 (0.359) long by 0.28 to 0.484 (0.416) wide. The eggs are from 0.0208 to 0.0242 (0.022-0.024) long by 0.0108 to 0.0139 (0.011-0.013) wide.

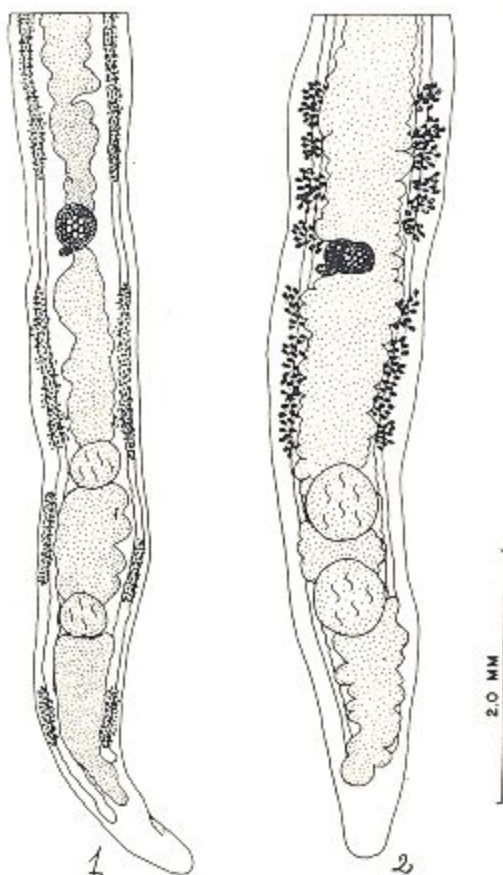


Plate II. *Parallopharynx arctus* Caballero, 1946; intraspecific variation in vitellaria: figure 1, vitellaria in four fields including intertesticular and post-testicular fields; figure 2, vitellaria in two fields only.

The vitellaria are highly variable in extent and position. In the type specimen the vitellaria form three main groups on each side. There is a post-testicular group, an inter-testicular group, and a pre-testicular group. In a few of the specimens of the present series, the vitelline glands are similarly arranged. In other specimens, however, there are no vitellaria posterior to the anterior margin of the anterior

testis. There may be two groups of vitellaria anterior to the testes, or these may fuse to form one group. In still other specimens, there are two distinctly separated groups of vitelline glands anterior to the testes as well as inter and post-testicular ones. In the latter case the result is four distinctly separated groups of vitelline follicles. Plate II is illustrative of these intraspecific variations.

Discussion: It can be seen from the above comparative description that in most cases the range of sizes in the present collection encompasses the published measurements of the type specimen of Caballero's species. In view of the oral lappets, the cuticular spination, the nature of the prepharynx, and the variability of the vitellaria, it is necessary to suggest certain additions to the generic diagnosis. For this reason, the generic diagnosis of Yamaguti (1958) is given below with the suggested additions included. The additions are underlined.

#### *Paralloparynx* Caballero, 1946

Generic diagnosis. Plagiorchiiidae, Astiotrematinae: Body slender, flattened cylindrical, *with or without spines*. Acetabulum small, in anterior third of body; Oral sucker larger than acetabulum, *and with two wing-like lappets which project laterally from the antero-ventral margin*. Prepharynx present, *relatively long, and quite muscular especially near the posterior end*. Pharynx comparatively large. Oesophagus very short. Intestinal bifurcation a considerable distance anterior to acetabulum; caeca reaching to posterior extremity; Testes tandem, near posterior end of body, separated by uterus. Cirrus pouch elongate, extending far back of acetabulum, enclosing winding seminal vesicle and well developed prostatic complex. Genital pore slightly out of median line, pre-acetabular. Ovary post-equatorial, nearer to anterior testis than to acetabulum. Receptaculum seminis and Mehlis' gland posterior to ovary. Laurer's canal present. Uterus in transverse coils, passing between two testes and reaching to near caecal ends, but not to posterior extremity. Metraterm shorter than cirrus pouch. Vitelline follicles extending in lateral fields of hindbody, *variable in extent and position; usually extend from some distance ahead of ovary to the anterior testis, may be divided to form two distinct groups of follicles one pre-ovarian and one post-ovarian; with or without inter-testicular and*

*post-testicular groups of vitelline follicles.* Lateral excretory ducts reaching to oral sucker. Intestinal parasites of Iguanidae.

Subfamily *Styphlodorinae* Dollfus, 1937

*Parahaplometroides basiliscae* n. gen. and n. sp.

Plate III

Host: *Basiliscus vittatus* Wiegmann.

Location: Mouth and auditory canals.

Locality: Rancho El Colorado, Municipio de Jalapa, Tabasco, México.

Holotype: U.S.N.M. Hel. Coll. No. 59897

Paratypes: Laboratorio de Helminología, Instituto de Biología, Universidad Nacional Autónoma de México, N° 218-23; Dept. of Zoology, L.S.U.; and author's collection.

Numerous examples of a large, muscular trematode were encountered in the oral cavity of the lizard *Basiliscus vittatus*. Some 57% of the hosts examined were found to be infected, and infections consisted of from one to twenty individuals. Studies of 35 whole mounts and one serially sectioned specimen have led to the conclusion that this form can not be placed in any of the existent genera. The name *Parahaplometroides* is hereby proposed to indicate an apparent relationship to the genus *Haplometroides* Odhner, 1911, which was described from the mouth of a snake from Paraguay. *P. basiliscae* was not encountered in any other host animal, and for this reason it is believed to be rather host specific. The species name has been selected to indicate this relationship.

Generic description: This genus has the characteristics of the subfamily *Styphlodorinae*, and it plainly belongs with that group as defined by Dollfus, 1937. The body is robust, muscular, slightly flattened, and bluntly rounded at each extremity. The cuticle is thick, and it contains long spines. Spines cover the anterior two-thirds of the body, and they terminate at a slightly post-testicular level. The oral sucker is larger, subterminal, and nearly equal in size to the acetabulum. The acetabulum is situated about one-third of the body length from the anterior end. Pharyngeal glands are present. Both a prepharynx and oesophagus are present and of

moderate length. The intestinal caeca are long, but they fail to reach the posterior extremity.

The testes are diagonally situated in the posterior half of the body. The cirrus and cirrus sac are large and mainly pre-acetabular

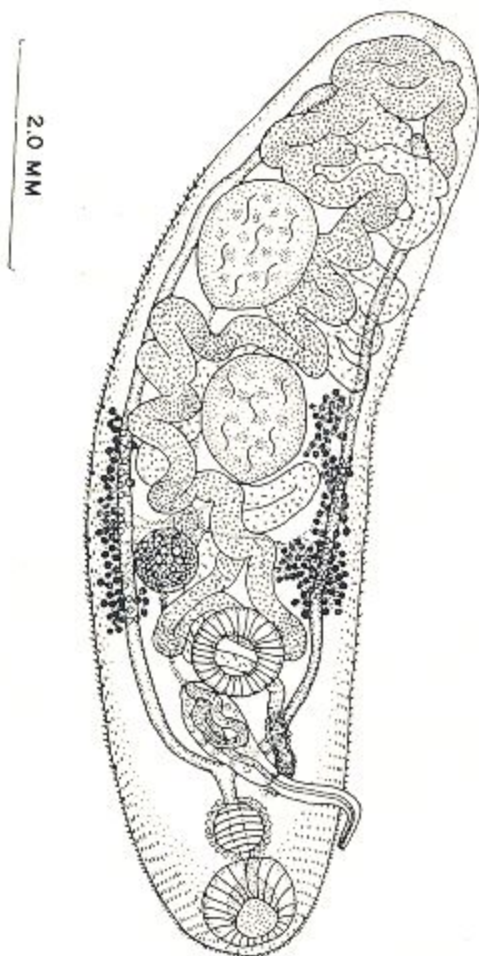


Plate III. *Parahaplometroides basiliscac*, drawing of entire worm as seen from ventral aspect.

in position. The seminal vesicle is contained within the cirrus sac, and it is extensively coiled. The genital pore is antero-dextral to the acetabulum.



The ovary is situated a short distance behind the acetabulum on the left side. A seminal receptacle is located immediately dorsal to the ovary, and a Laurer's canal is also present. The follicular vitellaria are dorsal to the caeca, and they extend from the posterior margin of the acetabulum to the level of the posterior margin of the anterior testis, or slightly beyond. The uterus coils between the testes and fills the post-testicular region of the body. The metraterm is strongly muscular and about half the length of the cirrus sac.

The excretory bladder is Y-shaped.

Discussion: *Parahaplometroides* appears to be quite distinct from other known genera in the family Plagiorchiidae. Its closest resemblance is to a form described from the mouth of a South American snake (*Elaps* sp.) by Odhner, 1911, which he called *Haplometroides buccicola*. Present material resembles Odhner's in the general distribution of the vitellaria and in the lateral displacement of the ovary and genital aperture.

The present form differs from *Haplometroides* in a number of characteristics that are believed to be of generic significance. In *Haplometroides* the genital pore is antero-sinistral to the acetabulum, and the ovary is to the right of the median line. In the present form, the genital pore is antero-dextral, and the ovary is on the left. In Odhner's form the acetabulum and cirrus sac are both small while in *Parahaplometroides* both of these structures are large and prominent. The new genus differs further from *Haplometroides* in possessing pharyngeal glands, a highly convoluted seminal vesicle, and intestinal caeca that are nearly full length. All of these factors, considered in the aggregate, have led to the conclusion that present material represents a previously undescribed genus.

Generic diagnosis. Plagiorchiidae, Styphlodorinae: Body robust, little flattened, with cuticular spination on anterior two-thirds. Acetabulum large, in anterior third of body. Oral sucker large, nearly equal to acetabulum. Pharynx moderately large, surrounded by glandular cells. Prepharynx and oesophagus both present, of moderate length. Intestinal caeca slender, extending to near the posterior extremity. Testes two, diagonal, in posterior half of body. Cirrus sac and cirrus large. Cirrus sac contains convoluted seminal vesicle. Ovary post-acetabular, to left of mid-line. Vitellaria dorso-lateral to caeca, between acetabulum and posterior margin of anterior testis. Seminal receptacle and Laurer's canal present. Uterus descends to

posterior extremity of body, ascends to genital pore. Genital pore antero-dextral to level of intestinal bifurcation. Metratrem one-half the length of cirrus sac. Eggs small and numerous. Excretory system Y-shaped. Parasites of oral cavity of Iguanidae.

Specific description: A specimen of intermediate size has been selected for use as a holotype, and measurements are given for that individual. After each measurement the extremes are given in parentheses. These have been arrived at by measuring the smallest and largest specimens in the series.

*Parahaplometroides basiliscae* has the generic characteristics that are listed above. The body is 8.60 (5.0-10.9) long by 2.38 (1.46-2.67) wide. The cuticle is relatively thick, and it measures 0.0138-0.0945 in thickness. The slender cuticular spines are shorter near the anterior end of the body where they average about 0.0242 in length. The spines become progressively longer posteriorly until a maximum length of about 0.059 is reached slightly behind the level of the posterior testis, at which level the spination ends abruptly leaving the remainder of the body unarmed.

The oral sucker is sub-terminal, and in certain stages of contraction of the worm it gives the appearance of being overhung by a slight dorsal lip. The oral sucker is slightly wider than long, and it measures 0.71 (0.456-0.685) long by 0.76 (0.456-0.762) wide. The prepharynx and oesophagus are relatively wide while the intestinal caeca are relatively slender. The caeca reach to within 1.15 (0.635-1.25) of the posterior end. The spherical pharynx measures 0.38 (0.254-0.482) in diameter. The acetabulum is nearly equal in size to the oral sucker. The acetabulum measures 0.75 (0.456-0.762) in diameter.

The testes are diagonally situated in the post-equatorial body region. They tend to be slightly oval in shape, and they are usually longer than wide. The anterior testis measures 1.20 (0.735-1.22) in length by 0.98 (0.66-1.08) in width. The posterior testis is quite often larger than the anterior one, and it measures 1.27 (0.76-1.28) in length by 0.965 (0.70-1.01) in width. The cirrus and cirrus sac are large and prominent structures. The cirrus sac measures 1.15 (0.70-1.15) in length by 0.445 (0.292-0.445) in width. The cirrus sac contains a convoluted seminal vesicle and prostatic cells.

The spherical ovary is located a short distance posterior to the acetabulum and well to the left of the median line. The ovary is

0.60 (0.507-0.736) in diameter. The vitellaria are follicular, mostly dorsal to the caeca, and they extend a variable distance medially to the caeca. Individual vitelline follicles range in size from 0.0635 to 0.127. The relatively small seminal receptacle is situated dorsal to the ovary, and it is quite variable in size. The Laurer's canal proceeds medially and then dorsally from the ootype to open on the dorsal body surface.

The ovoid, operculate eggs are very numerous in the uterus. The eggs measure 0.0208-0.0242 x 0.0485-0.052.

Discussion: As stated in the discussion above, *P. basiliscae* somewhat resembles one of the species of the genus *Haplometroides* Odhner, 1911. According to Skriabin (1958), there are only two species described in that genus. These are *H. buccicola* Odhner, 1911, and *H. rappiae* Szidat, 1932. The latter was described from *Rappia concolor* taken in Liberia. *H. rappiae* has very small suckers, a small cirrus sac, and the testes are parallel. Hence, it bears little specific resemblance to the form presently under consideration. A detailed comparison is, therefore, unnecessary.

*P. basiliscae* differs from *H. buccicola* in the following specific characteristics. It is considerably larger and more robust. The maximum size recorded for *H. buccicola* is 6 mm, while the present form reaches nearly 11 mm. in length. In the present species the acetabulum is large, and equal in size to the oral sucker. In *H. buccicola*, on the other hand, both suckers are small, and the acetabulum is considerably smaller than the oral sucker. In Odhner's species the vitellaria extend from the anterior margin of the acetabulum to the anterior margin of the posterior testis. In the new genus the vitellaria are more limited in extent, and they reach only from the posterior margin of the acetabulum to the posterior margin of the anterior testis. While the caeca of *P. basiliscae* nearly reach the posterior end of the body, in Odhner's species the caeca barely reach into the posterior one-third of the body. The eggs of *H. buccicola* measure 0.043-0.046 in length as compared to 0.0485-0.052 for the present species.

#### SUMMARY

The trematodes encountered in 28 specimens of *Basiliscus vittatus* Wiegmann from Tabasco, Mexico are reported and discussed. *Pa-*

*rallopharynx arctus* Caballero, 1946 is redescribed and the generic diagnosis is emended. A new genus and species of Styplodorinae is described from the oral cavity of the Basilisk lizard.

## RESUMEN

En esta contribución se reportan los tremátodos encontrados en 28 ejemplares de la lagartija (*Basiliscus vittatus* Wiegmann) que fueron capturados en el Estado de Tabasco, México. *Parallopharynx arctus* Caballero, 1946 se redescrive y se revisa la descripción del género. También está descrito un nuevo género y especie de la subfamilia Styplodorinae procedente de la boca de la lagartija.

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