specimen, has been described as a very damp area of the Kanneliya primary rain forest in the foothills of the Sabaragamuwa range of mountains where the annual rainfall is 180–200 inches (Grandison and Senanayake, 1966, p. 421).

If the locality of the Colombo Museum specimen (Hakgala, where Wall found *nepa* to be abundant) is acceptable, *walli* occurs both in the hills and in the low country of the Southern Province. The possibility of localized ecological factors that might separate *walli* and *nepa* remains to be explored.

In *The Snakes of Ceylon* (1921:xiii) Frank Wall wrote: "From available records many of the hill species appear to be very local, apart from inhabiting a restricted belt of elevation. I think it extremely probable that many more hill snakes remain to be discovered in peaks and ranges that have up to now escaped exploration." Perhaps, even after more than fifty years, such a statement may still be true.

Acknowledgments

For facilitating loans of specimens from collections under their care I am indebted to Dr. Charles M. Bogert and Dr. Richard G. Zweifel, American Museum of Natural History (AMNH); Miss Alice G. C. Grandison and Mr. A. F. Stimson, British Museum (Natural History) (BMNH); Dr. Alan E. Leviton, California Academy of Sciences (CAS); Dr. Robert F. Inger and Mr. Hymen Marx, Field Museum of Natural History (FMNH); and the late Dr. James A. Peters and Dr. George R. Zug, National Museum of Natural History (USNM). I also thank my friend and colleague, Dr. Roger Conant, for helpful suggestions and constant encouragement.

This contribution includes results of a study supported by the National Science Foundation (G2896, G8702, and G19400).

Literature Cited

Barbour, Thomas. 1912. Amphibia and Reptilia. *In* Some Chinese Vertebrates. Mem. Mus. Comp. Zool. 40(4): 125–137, pls. 1–2.

Boulenger, G. A. 1896. Catalogue of the snakes in the British Museum (Natural History), vol. 3, London, xiv + 721 pp.

Deraniyagala, P. E. P. 1955. A colored atlas of some vertebrates from Ceylon, vol. 3, Serpentoid Reptilia. Colombo, 121 pp., 36 text figs., 49 pls.

Dowling, Herndon G. 1951. A proposed method of expressing scale reduction in snakes. Copeia 1951(2):131–134.

Fitzinger, Leopoldo. 1843. Systema Reptilium, fasiculus primus, Amblyglossae. Vienna, 106 pp.

Grandison, Alice G. C., and Ranil F. Senanayake. 1966. Redescription of *Rana* (*Hylarana*) *aurantiaca* Boulenger (Amphibia: Ranidae). Ann. Mag. Nat. Hist., ser. 13, 9:419–421.

Laurenti, Josephi Nicolai. 1768. Specimen Medicum, Synopsin Reptilium. Vienna, 214 pp., 5 pls.

Merrem, Blasius. 1820. Versuch eines Systems der Amphibien/Tentamen Systematis Amphibiorum. Marburg, xv + 189 pp., 1 pl.

Pope, Clifford H. 1932. Collecting in northern and central China, pp. 470–480. *In* Andrews, R. C. The new conquest of Central Asia. Amer. Mus. Nat. Hist., New York, 678 pp., 12 text figs., col. front., 128 pls., maps; vol. 1 of Natural History of Central Asia.

———. 1934. List of Chinese turtles, crocodilians, and snakes, with keys. Amer. Mus. Novitates 733:1–29.

———. 1935. The reptiles of China. Amer. Mus. Nat. Hist., New York, iii + 604 pp., 78 text figs., 27 pls.; vol. 10 of Natural History of Central Asia.

Schlegel, Hermann. 1837. Essai sur la physionomie des serpens. Leide, 2 vols., folio atlas, 21 pls., 3 maps.

Schmidt, Karl P. 1927. Notes on Chinese reptiles. Bull. Amer. Mus. Nat. Hist. 54(4):467–551, figs. 1–22, pls. 28–30.

Smith, Malcolm. 1937. The names of two Indian vipers. Jour. Bombay Nat. Hist. Soc. 39:730–731.

———. 1943. The fauna of British India Ceylon and Burma, including the whole of the Indo-Chinese Sub-region. Reptilia and Amphibia, vol. 3, Serpentes. London, xii + 583 pp., 166 figs.

Stejneger, Leonhard. 1925. Chinese amphibians and reptiles in the United States National Museum. Proc. U.S. Nat. Mus. 66(2562):1–115, 4 figs.

Sowerby, Arthur de Carle. 1930. The reptiles and amphibians of the Manchurian region. *In* The naturalist in Manchuria, vols. 4–5, pp. 3–41, Tientsin.

Wall, Frank. 1921. Ophidia Taprobanica or the snakes of Ceylon. Colombo, xxii + 581 pp., 98 figs., map.

———. 1925. A hand list of the snakes of the Indian Empire, pt. 5. Jour. Bombay Nat. Hist. Soc. 30(2):242–252.

———. 1928. The poisonous terrestrial snakes of our British Indian Dominions (including Ceylon) and how to recognize them. With symptoms of snake poisoning and treatment. 4th ed., Bombay. Bombay Nat. Hist. Soc., 173 pp., 40 figs.

Footnotes

[1] One male, USNM 68541, here omitted, has what seems to be an abnormally short tail (34 caudals) but a terminal spine is present.

[2] The Japanese word "mamushi" is suitably applicable to all subspecies of *Agkistrodon blomhoffii*.

PROC. BIOL. SOC. WASH.
90(4), 1977, pp. 1016–1029

ACANTHOSTOME DIGENEANS FROM THE AMERICAN ALLIGATOR IN THE SOUTHEASTERN UNITED STATES

Daniel R. Brooks and Robin M. Overstreet

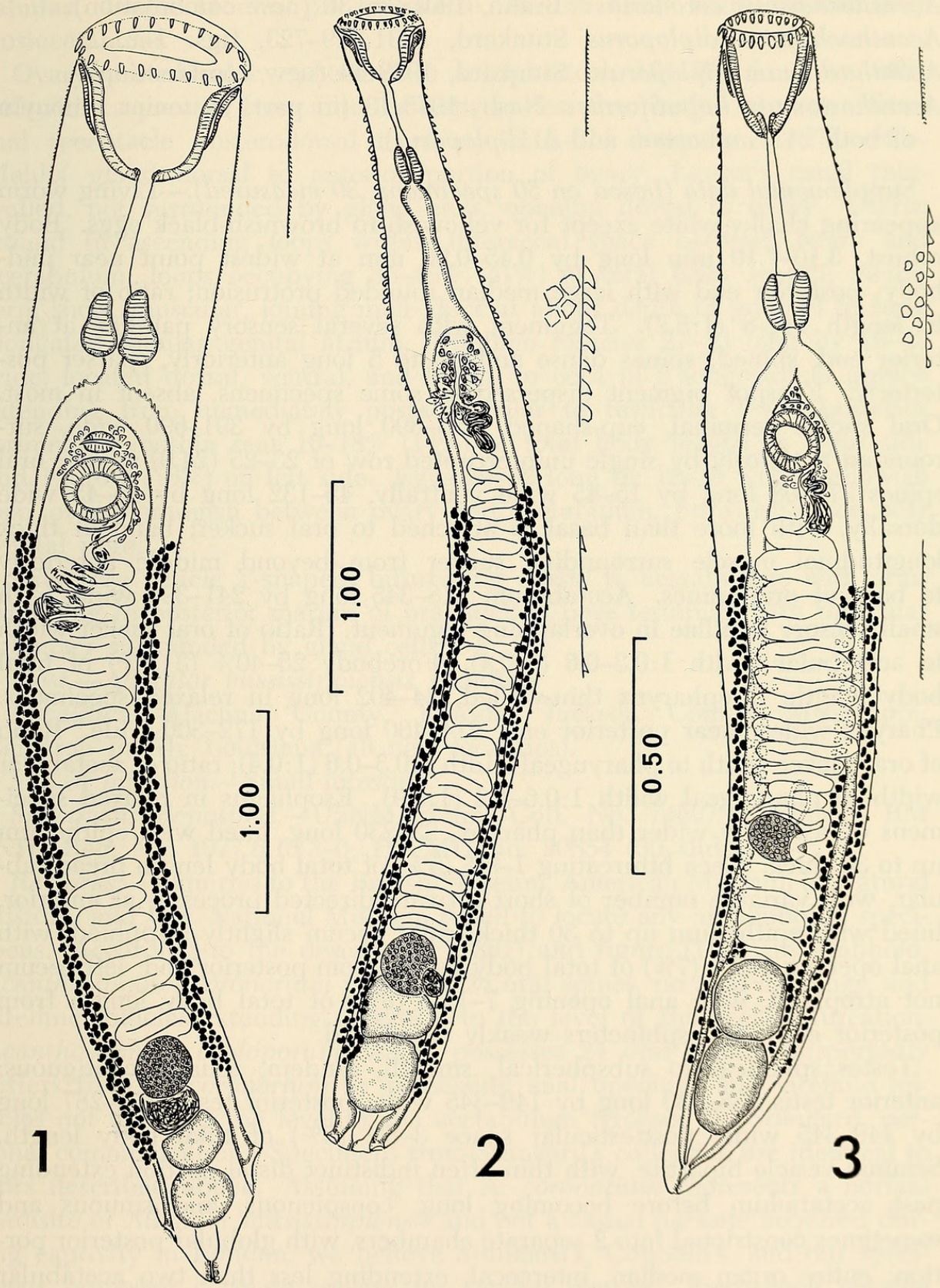
Two species of Acanthostomidae Poche, 1926 reportedly parasitize the American alligator, *Alligator mississippiensis* Daudin. Cobbold briefly described (1861) and subsequently figured (1864) *Distomum coronarium* from an alligator of unreported origin which died in the London Zoo, and Stunkard (1931) described *Acanthochasmus diploporous* from three hosts also of unreported origin. Lists by Hughes, Higginbotham, and Clary (1941, 1942) included both species of *Acanthostomum* Looss, 1899, but apparently no additional records exist. Nasir (1975) considered *A. coronarium*, *A. diploporum*, and several other species junior synonyms of the Old World *A. imbutiforme* (Molin, 1859) Morozov, 1955. We accept *A. coronarium* and *A. diploporum* as synonymous, but as distinct from *A. imbutiforme*. Based on new collections from Florida, Mississippi, and Louisiana, we herein provide descriptive and geographical data for three acanthostomes infecting the alligator, one of which is new. Morphological information provided for the known species supplements the original descriptions and allows differentiation from and comparisons with subsequently described species.

After removing worms from host intestines, we flattened them with minimal coverslip pressure, fixed them with a warm solution of ethyl alcohol-formalin-acetic acid (AFA), and stored them in 70% ethanol. Study included examination both of whole mounts stained with Van Cleave's hematoxylin or Mayer's hematoxylin mounted in Permount or Histoclad and of serial sagittal- and cross-sections stained with hematoxylin and eosin. Additional material was loaned from different individuals and museums acknowledged later. Measurements are in micrometers unless otherwise stated, with pertinent averages in parentheses; figures were drawn with the aid of a drawing tube. Abbreviations used to designate various museum collections include: USNM Helm. Coll. for U.S. National Museum Helminthological Collection, Beltsville, Maryland; BM (NH) for British Museum (Natural History), London, England; and HWML for Harold W. Manter Laboratory, University of Nebraska State Museum, Lincoln, Nebraska.

Acanthostomum coronarium (Cobbold)

Figs. 1, 7, 8, 12, 14–17

Distomum coronarium Cobbold, 1861:119.
Acanthostomum coronarium: Looss, 1899:578, 582 (new combination).



Figs. 1–3. Whole mounts of acanthostomes and close up views of tegumental spines, scales are mm. 1, *Acanthostomum coronarium*, ventral view; 2, *A. pavidum*, dorsal view; 3, *A. loossi*, ventral view.

Acanthochasmus coronarius: Braun, 1901:35, 36 (new combination).
Acanthochasmus diploporus Stunkard, 1931:719–723, figs. 1–2.
Acanthostomum diploporus: Stunkard, 1938:40 (new combination).
Acanthostomum imbutiforme: Nasir, 1975:13 (in part, as senior synonym of both *A. coronarium* and *A. diploporus*).

Supplemental data (based on 50 specimens, 30 measured).—Living worm appearing chalky-white except for yellowish to brownish-black eggs. Body robust, 3.10–7.10 mm long by 0.45–0.90 mm at widest point near midbody; posterior end with large median rounded protrusion; ratio of width to length 1:4–8 (1:5.2). Tegument with several sensory papillae at anterior end, spined; spines dense and up to 5 long anteriorly, sparser posteriorly. Eyespot pigment dispersed in some specimens, absent in most. Oral sucker terminal, cup-shaped, 425–690 long by 391–690 wide, surrounded anteriorly by single uninterrupted row of 23–25 (24.0) spines; oral spines 37–108 long by 15–45 wide ventrally, 45–132 long by 15–45 wide dorsally, with more than basal ½ attached to oral sucker; band of thick longitudinal muscle surrounding sucker from beyond middle anteriorly to base of oral spines. Acetabulum 218–345 long by 241–391 wide, with small sensory papillae in overlapping tegument. Ratio of oral sucker width to acetabular width 1:0.3–0.6 (1:0.4). Forebody 25–40% (31.0%) of total body length. Prepharynx thin-walled, 34–402 long in relaxed specimens. Pharynx widest near posterior end, 214–460 long by 172–300 wide. Ratio of oral sucker width to pharyngeal width 1:0.3–0.6 (1:0.4); ratio of acetabular width to pharyngeal width 1:0.6–1.2 (1:0.9). Esophagus in relaxed specimens occasionally wider than pharynx, 23–230 long, lined with epithelium up to 30 thick. Ceca bifurcating 1–9% (5%) of total body length preacetabular, with variable number of short forward-directed processes at anterior, lined with epithelium up to 30 thick; right cecum slightly atrophied, with anal opening 5–9% (7%) of total body length from posterior end; left cecum not atrophied, with anal opening 7–11% (9%) of total body length from posterior end; anal sphincters weakly developed.

Testes spherical to subspherical, smooth, tandem, usually contiguous; anterior testis 138–230 long by 149–345 wide; posterior testis 184–287 long by 149–345 wide; posttesticular space 3–8% (5%) of total body length. Seminal vesicle bipartite, with thin often indistinct distal portion extending past acetabulum before becoming long, conspicuous, and sinuous and sometimes constricted into 2 separate chambers, with globular posterior portion; entire organ median, intercecal, extending less than two acetabular lengths postacetabular. Prostatic duct surrounded by few prostatic cells. Preacetabular pit a transverse depression 79–211 (139) wide, surrounded by several elongated groups of gland cells, containing gonotyl 69–149 long by 93–175 wide and deeper than long. Genital pore immediately preace-

tabular. Postacetabular pit transverse, 92–185 (152) wide, immediately postacetabular.

Ovary pretesticular, spherical to subspherical, 161–310 long by 138–345 wide, separated from anterior testis by less than length of ovary. Seminal receptacle posterodorsal to ovary, 113–211 long by 37–277 wide. Mehlis' gland dorsal to anterior portion of ovary; Laurer's canal thin-walled, not surrounded by gland cells, opening dorsal to ovary. Uterus wound in ascending loops within intercecal space between ovary and acetabulum; loops occupying 35–48% (41%) of total body length; metraterm short, muscular, joining male duct at about depth of gonotyl to form elongated tubular genital atrium. Vitelline follicles 27–53 long by 16–40 wide, located dorsal, ventral, and lateral to ceca in 2 longitudinal groups extending from immediately postacetabular to testicular level; posterior termination within rear 10–18% (14%) of total body length on right side and 12–20% (16%) on left side. Eggs 29–32 long by 12–15 wide, yellowish near ovary, orangish between ovary and acetabulum, brownish-black near genital pore.

Excretory vesicle Y-shaped, bifurcating dorsal to acetabulum, with arms extending to posterior margin of oral sucker; pore terminal, with muscular sphincter surrounded by gland cells.

Host.—*Alligator mississippiensis* Daudin.

Localities.—Alachua County, Florida; Jackson County, Mississippi; Cameron Parish, Louisiana (all new localities).

Site of infection.—Small intestine.

Specimens deposited.—USNM Helm. Coll. No. 74507 (2 slides); BM (NH) Reg. No. 1977.6.13.3–6; HWML No. 20854 (30 slides).

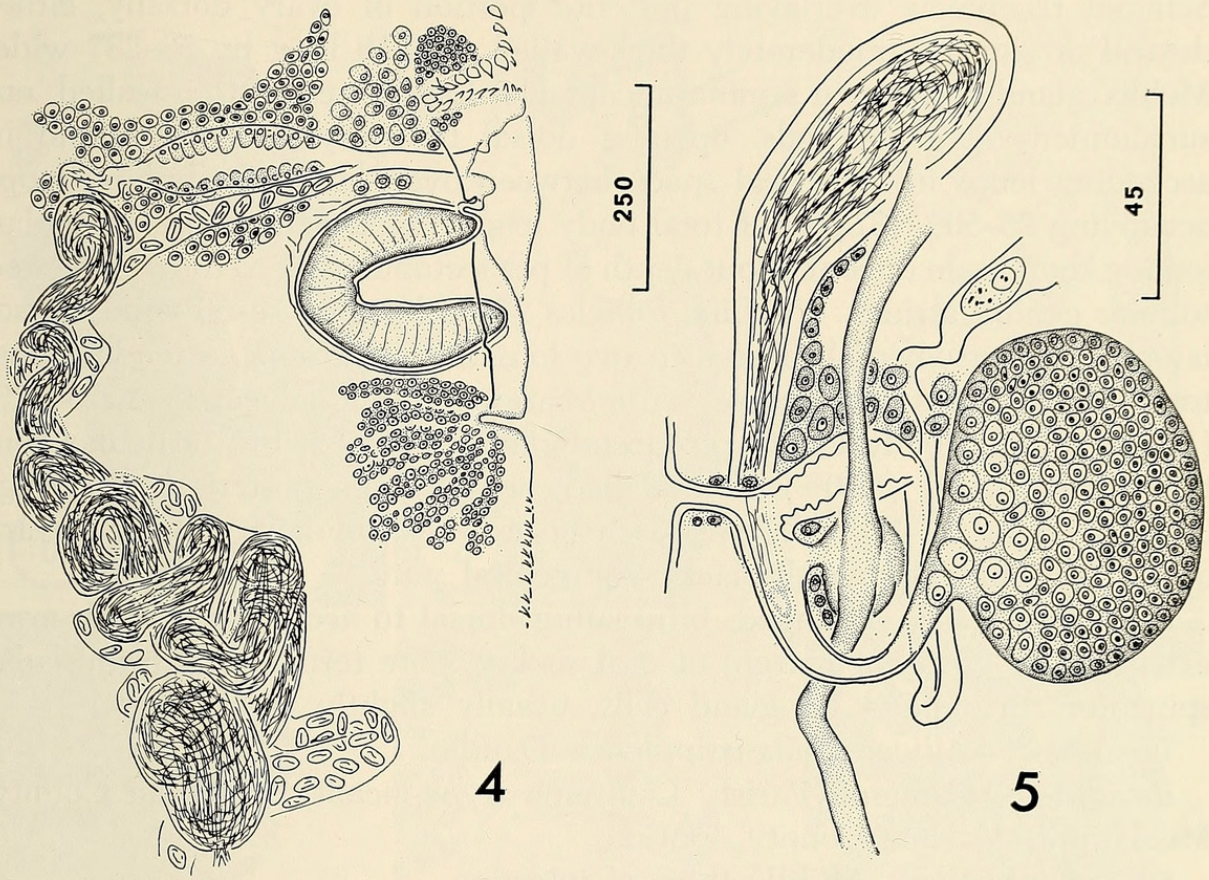
Remarks.—Inquiries to the British Museum, American Museum of Natural History, and U.S. National Museum failed to locate any of Cobbold's specimens. According to the description (1861) and figure (1864) by Cobbold, *Acanthostomum coronarium* possesses 24 oral spines, no anal openings, and vitelline follicles extending anterorly to the level of the cecal bifurcation. *Acanthostomum diploporum*, which possesses 24 oral spines, purportedly differs from *A. coronarium* by possessing anal openings and vitelline follicles not reaching the level of the acetabulum (Horace W. Stunkard, personal communication). Specimens from Stunkard's collection are identical to ours described above. Assuming that *A. coronarium* represents a normal parasite of *Alligator mississippiensis* and not a casual parasite acquired during captivity in London, we believe Stunkard's, Cobbold's, and our specimens represent a single species for several reasons. First, such notable workers as Looss, Odhner, Braun, and Stossich in the early twentieth century failed to note the presence of anal openings in a variety of acanthostomes, so Cobbold's specimens may have had them; additionally, Cobbold did not note a pharynx in his specimens, although surely one

occurred. Secondly, Stunkard's and our specimens possess vitelline follicles extending anteriorly to the posterior margin of the acetabulum with other prominently staining cells occurring anterior to them, and Cobbold could have interpreted gland cells or darkly-staining subtegumental parenchymal cells as vitelline follicles. In none of 26 nominal species of acanthostomes examined has the first author seen vitelline follicles extending farther anteriorly than the posterior margin of the acetabulum. Thirdly, we encountered only one of three acanthostomes infecting alligators which possessed 24 oral spines. We therefore declare *Acanthostomum diploporum* a junior synonym of *Acanthostomum coronarium.*

We consider the single specimen (USNM Helm. Coll. No. 2982) identified by A. Hassall as *Acanthostomum coronarium* from *Crocodilus acutus* in Honduras to be *A. americanum* (Pérez Vigueras, 1957) Yamaguti, 1971. Hughes and co-workers' reports (1941, 1942) of *A. coronarium* from *C. acutus* may have been based on that specimen because we found no other records of *A. coronarium* from *C. acutus*, and those reports did not include new collections.

Acanthostomum pavidum, new species
Figs. 2, 4, 9, 10

Description (based on 50 specimens, 30 measured).—Living worm appearing chalky-white except for yellowish to brownish-black eggs. Body elongate with attenuated anterior end and distinctly-truncated posterior end, 1.6–10.6 mm long by 0.4–1.1 mm at widest point near midbody; ratio of width to length 1:3–13 (1:8.2). Tegument spined, with several sensory papillae at anterior end; spines up to 5 long anteriorly, increasing in size toward acetabular level to a maximal 14–19 long by 11–14 basal width, conspicuously scalelike in midforebody and progressively smaller and sparser in hindbody. Eyespot pigment lacking. Oral sucker terminal, cup-shaped, 195–575 long by 230–552 wide, surrounded anteriorly by single uninterrupted row of 26–28 (27.0) spines; spines 45–77 long by 12–27 wide ventrally, 53–85 long by 12–27 wide dorsally, with more than basal ½ attached to sucker; band of thick longitudinal muscle surrounding sucker from beyond middle anteriorly to base of oral spines. Acetabulum 138–310 long by 72–322 wide, with small sensory papillae in overlying tegument. Ratio of oral sucker width to acetabular width 1:0.5–0.8 (1:0.6). Forebody 24–49% (35%) of total body length. Prepharynx muscular, pliable, 120–402 long in relaxed specimens. Pharynx usually widest near posterior end, 126–345 long by 115–345 wide. Ratio of oral sucker width to pharyngeal width 1:0.3–0.9 (1:0.5); ratio of acetabular width to pharyngeal width 1:0.5–1.5 (1:0.9). Esophagus wider than pharynx in relaxed specimens, 180–689 long, lined with epithelium up to 25 thick. Ratio of pharyngeal length to esophageal length 1:1.4–5.5 (1:2.0). Ceca bifurcating 2–6% (4.0%) of total body



Figs. 4–5. Scales are μm. 4, Terminal genitalia of *Acanthostomum pavidum*, lateral view; marginal folds formed during fixation and do not constitute a normal feature of whole mounts; 5, Female-complex of *A. loossi*, lateral view, from reconstruction of sagittally-sectioned specimen with minor alterations.

length preacetabular, lacking forward-directed processes near bifurcation, with epithelium up to 35 thick, opening at posterior end of body through separate ani; ani recessed, with weakly-developed sphinchters.

Testes spherical to subspherical, smooth, tandem, contiguous; anterior testis 149–460 long by 161–568 wide; posterior testis 148–575 long by 172–483 wide; posttesticular space 1–4% (2.5%) of total body length. Seminal vesicle bipartite, with thin long sinuous anterior portion and globular posterior portion, occasionally with constriction forming short third distal portion; entire organ dextral or sinistral, intercecal, usually extending less than 2 acetabular lengths postacetabular. Prostatic duct moderately swollen, surrounded by few prostatic cells free in parenchyma. Genital pore immediately preacetabular, separated from preacetabular pit; preacetabular pit a transverse depression 79–250 wide, lined with tegumental spines, lacking gonotyl, surrounded by clustered elongated groups of gland cells. Postacetabular pit a transverse slit 106–211 wide, immediately postacetabular.

Ovary pretesticular, spherical to subspherical, smooth, separated from or occasionally contiguous with anterior testis, 115–379 long by 149–425 wide.

Seminal receptacle overlaying posterior portion of ovary dorsally, either dextral or sinistral, moderately thick-walled, 86–316 long by 53–237 wide. Mehlis' gland anterior to seminal receptacle; Laurer's canal thin-walled, not surrounded by gland cells, opening dorsal to ovary. Uterus wound in ascending loops in intercecal space between ovary and acetabulum; loops occupying 25–50% (37.5%) of total body length; metraterm short, muscular, joining short male duct at about depth of preacetabular pit to form elongated tubular genital atrium. Vitelline follicles 27–66 long by 19–53 wide, dorsolateral and dorsomedial to ceca in two longitudinal groups, extending posteriorly from near level of posterior margin of seminal vescile or 5–17% (10.3%) of total body length postacetabular to near level of testicular contiguity or 10–14% (12.0%) of total body length from posterior end. Eggs 32–35 long by 15–17 wide, yellowish near ovary, orangish between ovary and acetabulum, brownish-black near genital pore.

Excretory vesicle Y-shaped, bifurcating dorsal to acetabulum, with arms extending to posterior margin of oral sucker; pore terminal with muscular spinchter surrounded by gland cells, usually slightly recessed.

Type-host.—*Alligator mississippiensis* Daudin.

Localities.—Cameron Parish, Louisiana (type-locality); Jackson County, Mississippi; Alachua County, Florida.

Site of infection.—Middle third of intestine.

Holotype.—USNM Helm. Coll. No. 74505. *Paratypes.*—USNM Helm. Coll. No. 74506 (2 slides); BM (NH) Reg. No. 1977.6.13.9–11; HWML No. 20851–20852 (42 slides).

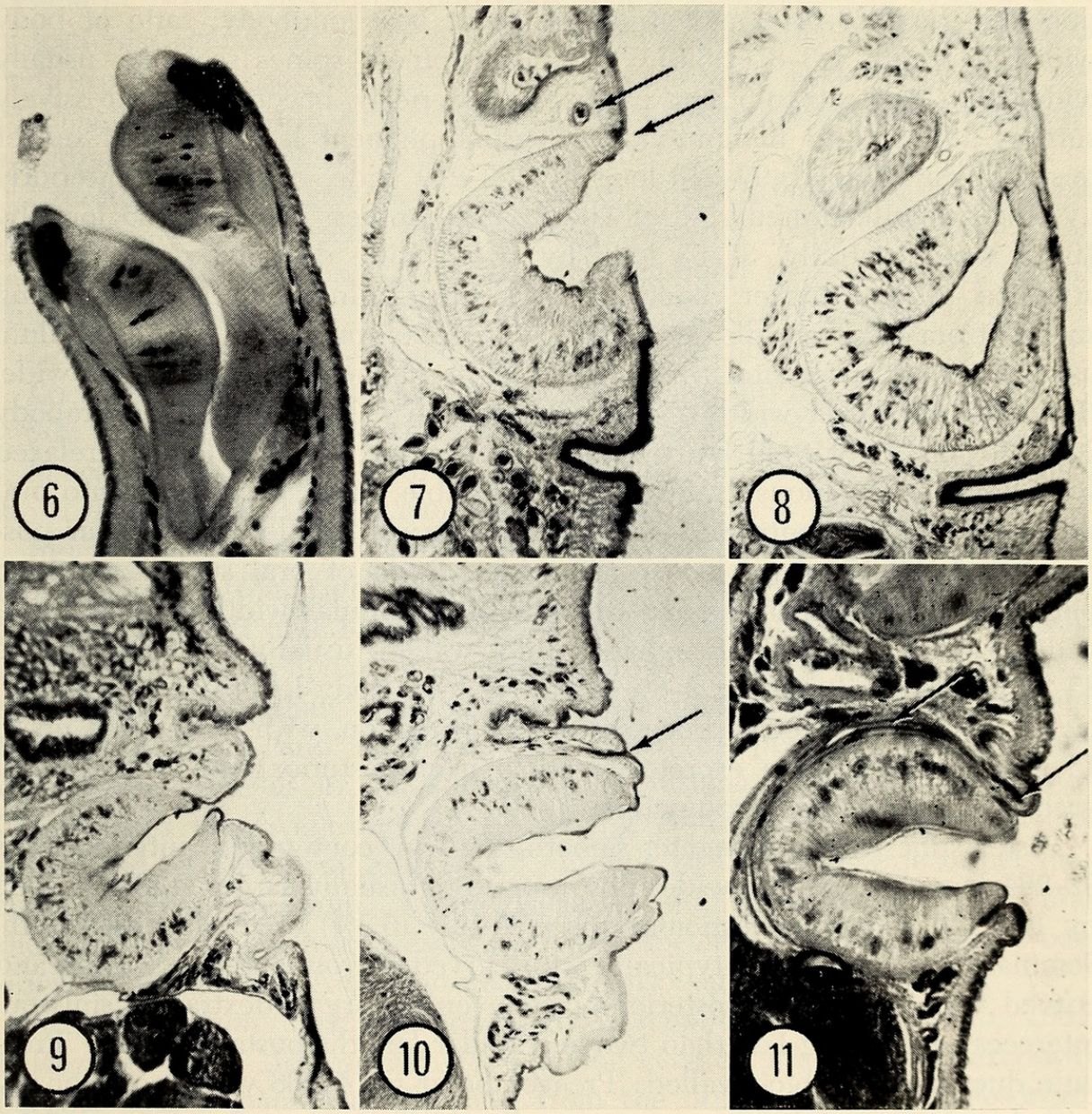
Etymology.—The Latin *pavidum*, meaning fierce, alludes to the oral spines and robust tegumental spines in the forebody.

Remarks.—*Acanthostomum pavidum* resembles *A. marajoarum* (Teixeira de Freitas and Lent, 1938) Hughes, Higginbotham, and Clary, 1941, *A. brauni* Mañé-Garzón and Gil, 1961, and *A. caballeroi* Pelaéz and Cruz, 1953 by possessing distinctly robust tegumental spines in the forebody, an esophagus longer than the pharynx, and anal openings at the posterior end of the body. It differs from all of them by having 26–28 rather than 20–23 oral spines and eggs more than 30 μm long. The new species differs additionally from *A. brauni* and *A. marajoarum* by having a prepharynx typically longer than the pharynx and from *A. brauni* by having a sucker ratio of more than 1:0.5.

Acanthostomum loossi (Pérez Vigueras)
Figs. 3, 5, 6, 11, 13

Acanthochasmus loossi Pérez Vigueras, 1957:21–23, fig. 53 (in crocodile from Cuba).

Acanthostomum loossi: Groschaft and Baruš, 1970:290–291, fig. 1 (new combination).



Figs. 6–11. Sagittal sections of acanthostomes. 6, *Acanthostomum loossi*, oral sucker showing 2 oral spines and longitudinal band of muscle encircling anterior portion of sucker; 7 and 8, *Acanthostomum coronarium*, gonotyl and postacetabular pit. 7 shows a central cavity in the preacetabular pit and an enclosed egg which had been engulfed from the worm's media. The genital atrium, also with an enclosed egg, empties immediately anterior to acetabulum (arrows). 8 is a more lateral section of the same worm showing the muscular gonotyl. 9 and 10, *Acanthostomum pavidum*. 9, Lateral section showing lateral margin of postacetabular pit; 10, Medial section showing genital pore (arrow) and considerable protrusion of postacetabular tegument; both 9 and 10 reveal tegumental spines of preacetabular pit. 11, *Acanthostomum loossi*, note lack of a postacetabular pit; arrows indicate genital atrium.

Acanthostomum scyphocephalum: Nasir, 1975:3 (in part, as senior synonym).

Supplemental data (based on 30 specimens, 19 measured).—Living worm appearing chalky-white except for yellowish to brownish-black eggs. Body fusiform, more attenuated anteriorly, slightly truncate posteriorly, 1.18–2.92

mm long by 0.23–0.44 mm at widest point near midbody; ratio of body width to length 1:3–8 (1:5.6). Tegument spined; spines scalelike, usually wider than long, up to 5 long by 8 wide anteriorly, becoming progressively smaller and sparser in hindbody. Eyespot pigment lacking. Oral sucker terminal, cup-shaped, 92–270 long by 103–210 wide, surrounded anteriorly by single uninterrupted row of 20–22 (21.0) spines; spines 27–45 long by 10–15 wide ventrally, 37–53 long by 10–15 wide dorsally, with basal ½ attached to oral sucker; band of thick longitudinal muscle surrounding sucker from near middle anteriorly to base of oral spines. Acetabulum usually round in frontal view, 103–172 in diameter, deeper than wide. Ratio of oral sucker width to acetabular width 1:0.6–0.9 (1:0.7). Forebody 20–41% (31.2%) of total body length. Prepharynx 100–598 long in relaxed specimens, conspicuously muscular and pliable, often protruding into oral sucker in slightly contracted specimens. Pharynx usually widest near posterior end, 80–172 long by 57–172 wide. Ratio of oral sucker width to pharyngeal width 1:0.5–0.8 (1:0.6); ratio of acetabular width to pharyngeal width 1:0.4–1.0 (1:0.8). Esophagus thick-walled, usually indistinct, up to 35 long. Ceca bifurcating 2–8% (4.0%) of total body length preacetabular, lacking forward-directed processes near bifurcation, with epithelium up to 15 thick, opening into excretory vesicle near posterior end of body; ani with weakly-developed sphincters.

Testes spherical to elongate, smooth, tandem, contiguous; anterior testis 92–264 long by 138–241 wide; posterior testis usually larger, 149–276 long by 103–210 wide; posttesticular space 2–12% (5.3%) of total body length. Seminal vesicle bipartite, typically with curved narrow anterior portion and curved wide elongated posterior portion; entire organ dextral or sinistral, intercecal, extending less than two acetabular lengths postacetabular. Prostatic duct narrow, thick-walled. Preacetabular pit 42–66 wide, occasionally with few tegumental spines on upper lip, lacking gonotyl, surrounded by gland cells free in parenchyma. Genital pore immediately preacetabular, not opening through preacetabular pit. Postacetabular pit lacking.

Ovary spherical to transversely elongate, smooth, pretesticular, separated from anterior testis by about one ovarian length, 46–240 long by 115–240 wide. Seminal receptacle partially or entirely preovarian, median or submedian, 87–145 long by 50–119 wide, exceptionally thick-walled. Mehlis' gland overlying anterior of ovary; Laurer's canal thick-walled, surrounded by few gland cells, opening anterodorsal to ovary. Uterus wound in ascending loops in intercecal space between anterior testis and acetabulum; loops occupying 26–63% (42.1%) of total body length; metraterm relatively long and thick-walled, joining male duct near posterior border of acetabulum to form elongate tubular genital atrium. Vitelline follicles 16–29 long by 16–27 wide, located dorsolateral, dorsomedial, and rarely ventral to ceca in longitudinal groups, extending from near posterior margin of seminal

vesicle or 7–19% (13.4%) of total body length postacetabular to near level of testicular contiguity or 11–24% (17.3%) of total body length from posterior end, nearly confluent dorsal to anterior testis in most specimens. Eggs 23–25 long by 7–12 wide, yellowish near ovary, orangish between ovary and acetabulum, brownish-black near genital pore.

Excretory vesicle Y-shaped, bifurcating dorsal to anterior or in some cases posterior testis, with arms reaching posterior margin of oral sucker; pore terminal with muscular sphincter surrounded by gland cells, usually slightly recessed.

Host.—*Alligator mississippiensis* Daudin (new host).

Locality.—Cameron Parish, Louisiana (new locality).

Site of infection.—Anterior ½ of intestine.

Specimens deposited.—USNM Helm. Coll. No. 74508; BM (NH) Reg. No. 1977.6.13.7–8; HWML No. 20853 (8 slides).

Remarks.—Our specimens of *Acanthostomum loossi* agree closely with those reported from Cuba by Pérez Vigueras (1957) in *Crocodilus acutus* and by Groschaft and Baruš (1970) in *C. rhombifer*. Pérez Vigueras originally described *A. loossi* as possessing blindly-ending ceca, a point corroborated by Groschaft and Baruš. We examined three of Groschaft and Baruš' specimens, and interpreted the ceca to open into the excretory vescile, the same as in our specimens. Louisiana specimens differ from Cuban ones that we examined by having 20–22 rather than 22–23 oral spines and by possessing eggs 23–25 μm long by 7–12 μm wide rather than 25–30 μm by 13–15 μm. Future work, including life-cycle studies, may show our specimens to represent a distinct species, but at present we consider the Cuban and American material conspecific.

Acanthostomum loossi differs from *A. scyphocephalum* (Braun, 1901) Peláez and Cruz, 1953 primarily by having ceca opening into the excretory bladder rather than externally and from the other two species described here in several respects other than the position of the ovary, lack of a postacetabular pit, and lack of ani opening externally. One notable point is the relatively thick ducts in the female system (Figs. 5 and 13).

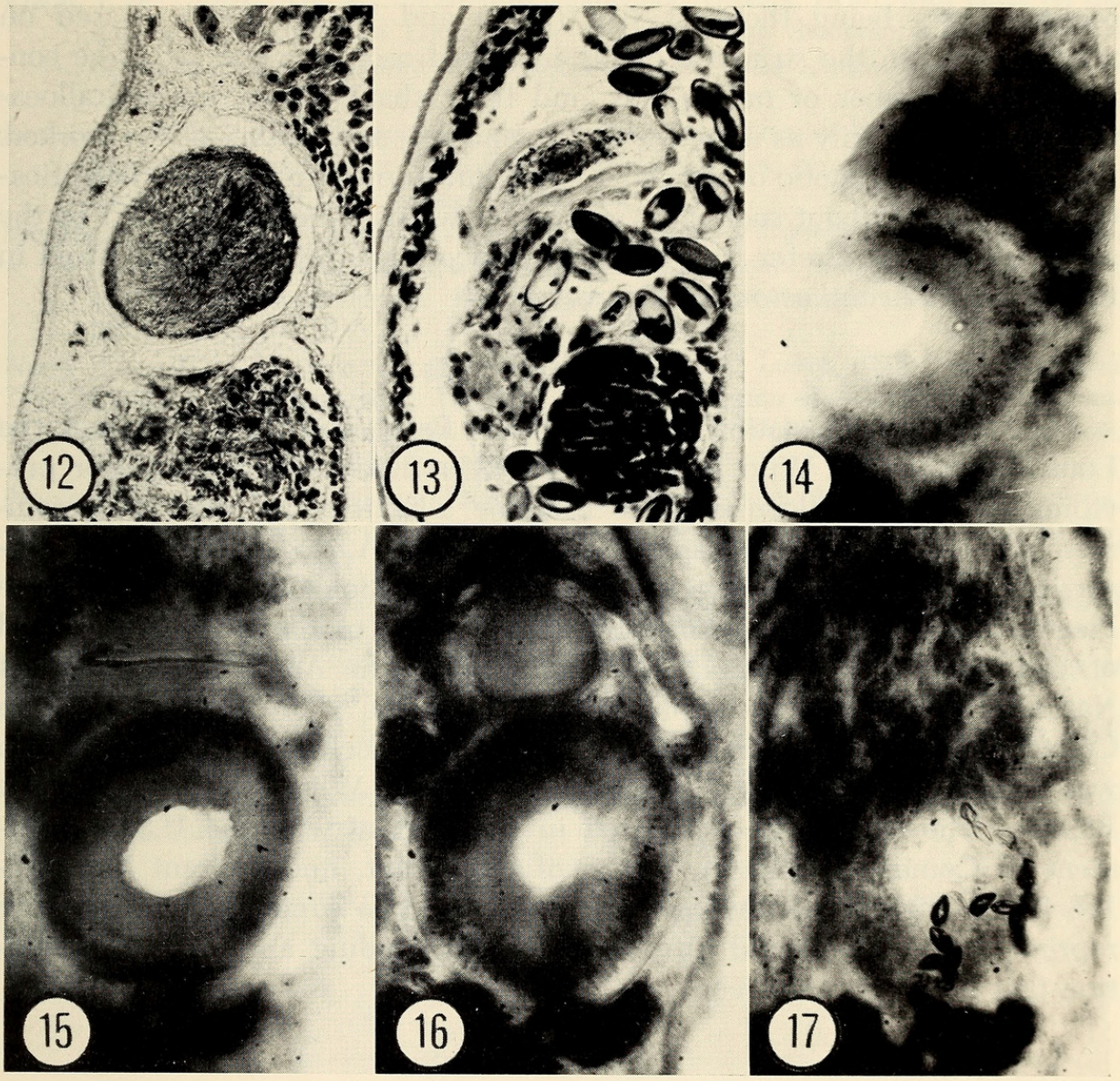
Discussion

Characteristics of terminal genitalia and adjacent structures have been omitted from most descriptions and differ among the three species we described. In each, the acetabulum is embedded within the ventral surface and presumably eversible through a round tegumental opening. Each species also has a distinct preacetabular transverse pit formed from invaginated tegument and associated with glandular cells (Figs. 7–11). The pit in *A. coronarium* contains a nucleated muscular gonotyl, that in *A. pavidum* harbors a continuum of tegumental spines, and that of *A. loossi*

lacks structures except for a few tegumental spines in the anterior portion of some specimens. In none of the three does the genital pore empty into either the acetabular cavity or the transverse pit. The male duct distal to the pars prostatica joins the metraterm to form an elongated tubular genital atrium (= hermaphroditic duct) that typically follows the anterior border of the acetabulum before exiting immediately anterior to the tegumental lip covering the sucker. A short distance posterior to the acetabula of *A. coronarium* and *A. pavidum* occurs a postacetabular pit also formed as an invagination of the tegument and associated with glandular cells.

The above features show both similarities and differences with members of the closely related cryptogonimids as well as with the heterophyids and other families. Witenberg (1929) termed the genital sac of heterophyids which usually included an acetabulum and gonotyl as the ventrogenital sac. Since that time, confusion has persisted as to what constitutes the sac and the gonotyl. Cable et al. (1960) and Pearson (1973) helped clarify most of the problems; they assumed that an acetabulum had to be present in a ventrogenital sac, and both described and discussed the gonotyl. Cable et al. termed an invagination lacking a sucker but possessing a genital pore in *Opisthovarium elongatum* Cable, Connor, and Balling, 1960 as a genital sac. Pearson considered a cavity well anterior to the ventral sucker and genital pore in *Galactosomum sinuilactis* Pearson, 1973 as a ventral pit. Even though the term preacetabular pit has been recognized for a similar nonhomologous structure in hemiurids, we use that term here. We also prefer to use postacetabular pit for the posterior cavity rather than Cain's (1966) term pseudogonotyl. Groschaft and Baruš (1970) reported a postacetabular pit as a pseudogonotyl in three acanthostomes, but they considered the preacetabular pit a gonotyl. What we consider a gonotyl in our specimens (Figs. 8, 14, 16) is restricted to *A. coronarium*. That muscular organ possessed nuclei as do the gonotyls of *Heterophyes* Cobbold, 1886 and some cryptogonimids but not those of haplorchines (Pearson, 1973). In the heterophyids, the tubular genital atrium either extends into the gonotyl or empties at its base. On the other hand, the tubular atrium seldom, if ever, pierces the gonotyl in cryptogonimids; it usually opens at the anterior border of the acetabulum rather than slightly separated from it as in acanthostomes. Mueller and Van Cleave (1932) illustrated the gonotyl for a variety of cryptogonimid genera; however, we prefer to consider some of those illustrated homologous structures that are neither papillalike nor within a cavity as muscular pads.

Without having observed acanthostomes in copula, we must speculate on a method of copulation. Quite possibly the preacetabular pit of one member of a mating pair everts and inserts into the recessed pit of the other. Perhaps with the additional aid of an everted postacetabular pit, sensory papillae about the motile acetabulum, and glandular products



Figs. 12–17. 12 and 13, Sagittal sections of seminal receptacle. 12, Thin-walled receptacle of *Acanthostomum coronarium*; 13, Thick-walled one of *A. loossi*. 14–17, Whole mounts of acetabular region of *A. coronarium*: 14, Specimen showing extruded gonotyl; 15–17, Another individual with a noneverted gonotyl showing pit openings and some glandular cells at and near ventral surface (15), gonotyl at cecal level (16), and metraterm and elongated groups of glandular cells dorsal to acetabulum (17).

from the pits, head-to-head copulation should result in alignment assuring close apposition of genital pores and mutual insemination.

Variation among the pits in the three, in addition to the different positions along the intestine inhabited by those species, could inhibit interspecific copulation of those sympatric digeneans. We know that *A. coronarium* everts a powerful gonotyl (Figs. 14–17), *A. pavidum* has spines in the preacetabular pit, and *A. loossi* is both the smallest and only species without a postacetabular pit.

Various authors have repeatedly subdivided the acanthostomes, the most