

**A Review of the Trematode Genus *Hamacreadium* Linton, 1910
(Opecoelidae), with Descriptions of Two New Species
from the Red Sea Fishes**

M. M. RAMADAN

(Received for publication; June 13, 1983)

Key words: *Hamacreadium*, trematodes from Red Sea fishes

Introduction

Linton (1910) established the genus *Hamacreadium* for Allocreadiid trematodes having oblique testes, claviform and preacetabular cirrus pouch, lobulated ovary and caeca terminating at the posterior body end. *H. mutabile* Linton, 1910 represents the type species of the genus. Manter (1947) indicated a great similarity between the genera *Hamacreadium* and *Plagioporus* Stafford, 1904, since *Hamacreadium* has a longer excretory vesicle than in *Plagioporus*. However, there are considerable variations among the described species and in some cases this character is not given.

Peracreadium Nicoll, 1909 and *Cainocreadium* Nicoll, 1909 are closely related genera, with median genital pore. They are confused with *Hamacreadium* and *Plagioporus*, but the latter two genera have genital pores to the left. Yamaguti (1958) listed *Peracreadium* as a synonym of *Cainocreadium*, but Durio and Manter (1968) transferred *Hamacreadium* species with a

median genital pore to the genus *Cainocreadium*, these included: *H. pterois* Nagaty and Abdel Aal, 1962; *H. epinepheli* Yamaguti, 1934; *H. gulella* Linton, 1910; *H. longisaccum* Siddiqi and Cable, 1960 and *H. lintoni* Siddiqi and Cable, 1960.

Mehra (1966) proposed the genus *Staffordiella* for *Psilostomum chilkaei* Chatterji, 1958 from *Lates calcarifer* from India, but Yamaguti (1971) considered this species as *Hamacreadium chilkaei*. Since the species in consideration miss the diagonal position of testes (a main generic character of the genus *Hamacreadium*). The present author reported that in *Hamacreadium rastrellii* Bilquees and Masood, 1975 and *H. karachiensis* Bilquees and Masood, 1975 which were described from *Rastrelliger kanagurata* from India, also miss the diagonal position of testes. Accordingly, the present author suggests that these two species should be transferred to the genus *Plagioporus* Stafford, 1904.

Durio and Manter (1968) proposed the genus *Pacificreadium* for *Hamacreadium serrani* Nagaty and Abdel Aal, 1962 from *Serranus miniatus* in the Red Sea. The specimen in consideration was the same with those collected from *Epinephelus* sp. in New Caledonia and from Serranid fishes in Australia. Durio and Manter (1968) characterised the genus *Pacificreadium* by

This research was undertaken by the author while holding a post-doctoral scholarship from the Egyptian Ministry of Higher Education in Harold W. Manter Laboratory, Division of Parasitology, University of Nebraska State Museum, University of Nebraska, Lincoln, 68508, U.S.A.
Department of Biology, Faculty of Education, Ain Shams University, Cairo, Egypt.

Table 1 A comparison between *Hamacreadium interruptum* Nagaty, 1941 and *Hamacreadium balistes* Nagaty and Aal, 1962 b

Characters	<i>Hamacreadium interruptum</i>	<i>Hamacreadium balistes</i>
Body shape	elongate	elongate
Length	2.37-3.53	3.45-4.80
Width	0.64-1.07	0.95-1.37
Length/Width	3.5 : 1	3.5 : 1
Tegument	smooth	smooth
Oral sucker	0.18-0.33×0.25-0.43	0.24-0.38×0.27-0.41
Ventral sucker	0.42-0.59	0.38-0.56×0.41-0.51
Oral sucker/ Ventral sucker	0.61 : 1	0.7 : 1
Pharynx	0.13-0.22×0.18-0.25	0.14×0.21×0.18-0.24
Testes	Ovoid, in third quarter, 0.20-0.33×0.20×0.33	Ovoid, in third quarter, 0.38×0.23-0.27
Cirrus pouch	anterior to acetabulum, curved, 1.02×0.17	anterior to acetabulum, curved, 0.35×0.08
Genital pore	left to intestinal bifurcation	left to intestinal bifurcation
Ovary	4 lobes, anterior to right testis, 0.12-0.22×0.17-0.31	4 lobes, anterior to right testis, 0.20-0.23×0.26-0.29
Vitellaria	with wide gap at ventral sucker	interrupted at ventral sucker
Eggs	68-77 μ×41-50 μ	70×40 μ
Hosts	<i>Lethrinus mehsenoides</i>	<i>Lethrinus nebulosus</i> and <i>Balistes aculeatus</i>
Locality	Al-Ghardaga, Red Sea	Al-Ghardaga, Red Sea

the extension of the excretory vesicle across the caecal bifurcation to end alongside the pharynx, and thus they corrected the original description of *H. serrani* was that the tubular branches near the pharynx are not branches of the caeca but the excretory vesicle, these are close to the caeca but are ventral, stain differently, and contain dark—staining granules.

Lamothe (1962) changed *Hamacreadium lethrini* Nagaty and Abdel Aal, 1962, a parasite of *Lethrinus mehsenoides* from Red Sea, to *H. nagaty* since the combination *H. lethrini* was previously used by Yamaguti, 1934 for a parasite of *Lethrinus haematopterus*. Fischthal and Kuntz (1965) redescribed *Hamacreadium interruptum* Nagaty, 1941 from *Lethrinus microdon* from North Borneo. They also synonymized *Plagioporus (Plagioporus) longivesicula* Yamaguti, 1952 with this species. Pritchard (1966) transferred *H. mehsena* Nagaty, 1941 to the genus *Podocotyle* and Yamaguti (1971) transferred *H. diacope*

Nagaty and Abdel Aal, 1962 to the genus *Plagioporus*. The both species were described from the Red Sea fishes.

Yamaguti (1971) arranged the trematode families on the basis of life history information of the digenetic trematode. Accordingly, the genus *Hamacreadium* has been placed under the family Opecoelidae Ozaki, 1925. Skrjabin (1964) proposed a key for six species of the genus *Hamacreadium* which was based on the lobulation of testes, genital pore position and extension of vitellaria and excretory bladder.

Saoud, Abu Sinna and Ramadan (1977) described *Hamacreadium caranxi* from *Caranx altissimus* from the coastal waters of the Red Sea in Sudan. They also proposed the important criteria according to opinion amongst investigators working on the genus *Hamacreadium* in the following: extent and distribution of vitellaria; shape and position of testes and ovary; position, size and shape of cirrus pouch; position of the genital pore; shape and measurements

of eggs; relative size of oral and ventral suckers and presence or absence of diverticula at intestinal caeca bifurcation. However, on reviewing the available descriptions of *Hamacreadium* species, it is found that the validity of some of them is doubtful. The description of *H. interruptum* Nagaty, 1941 is closely similar to that of *H. balistesi* Nagaty and Abdel Aal, 1962; a comparison of the two species is given in Table 1.

It is evident from Table 1 that apart from minor differences in certain measurements, the two species are so much alike. Accordingly, the present author suggests that *H. balistesi* should be considered as a synonym of *H. interruptum*.

In the present work the author follows the above two views of Skrjabin (1964) and Saoud *et al.* (1977) in differentiating the various species of the genus *Hmacreadium*.

Materials and Methods

The identification of the fishes as well as the methods followed in the collection, fixation and staining of trematodes were described according to Ramadan (1982). Drawings were made to scale using a camera lucida. All measurements are in millimetres, unless indicated otherwise. The study revealed to one known species and two hitherto undescribed species which are different from the known species of the genus and are thus designated as new species.

Descriptions

1. *Hamacreadium mutabile* Linton, 1910 (Fig. 1)

Fifteen specimens collected from *Lethrinus mahsena* locally called "Bonqos", *L. nebulosus* locally called "Shuura", *Epinephalus chlarostigma* locally called "Qúshar Abo Ads", *E. summana* locally called

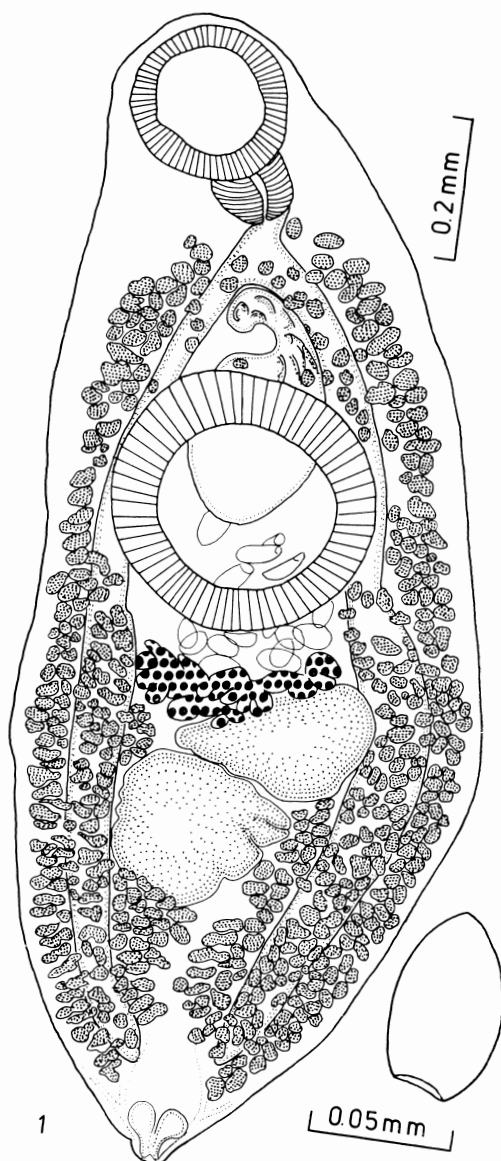


Fig. 1 *Hamacreadium mutabile* Linton, 1910.

A—Ventral view.

B—Egg.

"Qúshar kharna" and *Anampses caeruleopunctatus* locally called "Mallas".

Body length 1.45–1.70. Body width 0.65–0.80. Tegument smooths. Length to width ratio 1.81–2.62:1. Oral sucker 0.15–0.24 × 0.15–0.25. Ventral sucker 0.22–0.36 × 0.23–0.36. Prepharynx 0.02 in length. Pharynx

0.09–0.14×0.09–0.10. Oral sucker to ventral sucker ratio 0.58–0.75:1. Oesophagus 0.03–0.05 in length. Testes diagonal, slightly indented, anterior testis 0.16–0.18×0.11–0.34., posterior testis 0.18–0.21×0.10–0.34. Cirrus pouch 0.13–0.32×0.11–0.21. Genital pore at level of intestinal caeca bifurcation, 21–24 μ in diameter. Ovary 4–6 lobes, 0.08–0.21×0.09–0.29. Receptaculum seminis 0.14–0.16×0.08–0.11. Vitellaria extending between intestinal bifurcation and posterior body end. Uterus anterior to ovary. Eggs operculated, 53–64×26–41 μ . Excretory vesicle elongated, sac-shaped.

Discussion

Linton (1910) originally described *Hamacreadium mutabile* from *Lutianus griseus*, *L. apodus*, *Anisotremus virginicus*, *Ocyurus chrysurus* and *Pomacanthus arcuatus* in Tortugas and also from *Lutianus viridis* and *Mycteroperca xenarcha* in Galapagos.

Yamaguti (1934) described *Hamacreadium epinepheli* from *Epinephelus akaara* from the Inland Sea and from *Lethrinus haematopterus* in the Pacific Coast of Japan. He differentiated it from *H. mutabile* by the position of the genital pore which lies directly behind the intestinal caeca bifurcation in *H. epinepheli*, egg size and relatively large pharynx. However, Nagaty (1941) believed that the difference between these two species are insufficient and considered the synonym of *H. epinepheli* Yamaguti, 1934 to *H. mutabile* Linton, 1910 and redescribed *H. mutabile* from *Serranus merra*, *Lethrinus mahsena*, *L. nebulosus*, *Teuthis marmorata* and *Diacope fulviflamma* in Red Sea.

Yamaguti (1958) again retained the validity of *H. mutabile* and *H. epinepheli*. Parukin (1970) considered that the two species are separate, although both species are actually very close to each other. However, Durio and Manter (1968) transferred *H. epinepheli* to the genus *Caino-*

creadium Nicoll, 1909. Parukin reported *H. mutabile* in the following Red Sea fishes: *Holocentrus cornutus*, *H. lacteoguttatus*, *Lethrinus enigmaticus*, *Pempheris analensis*, *Cephalopholis miniatus*, *Selar crumenophthalmus*, *Lutianus bohar*, *L. gibbus* and *Myripristis murdjan* and also recorded *H. epinepheli* in *Lithognathus lithognathus*. However, the present author believes that the above differences mentioned between the two species are normally occur within the same species, mostly due to the effect of fixative used and accordingly, Nagaty and Parukin opinions are accepted.

Manter (1963) redescribed *H. mutabile* from *Lethrinus* sp. in Fiji. Durio and Manter (1968) reported (without description) *H. mutabile* from *Lutianus fluvi-flamma*, *L. anabilis*, *L. sp.* and *Lethrinus miniatus* from Australia. Yamaguti (1971) added *Lutianus synagris*, *L. jocu*, *L. analis* and *Epinephelus striatus* for this trematode. He also synonymized *H. mutabile* of Siddiqi and Cable, 1960 to *H. confusum* Overstreet, 1969. Recently, Hafeezullah (1971) considered the synonymy of *H. leiperi* Gupta, 1956 (from marine cat fish in India) to *H. mutabile*.

2. *Hamacreadium ghardagense* n. sp. (Fig. 2)

The following description is based on one mature specimen collected from *Variola louti* locally called "Qúshar sherif" caught from Al-Ghardaga, Red Sea.

The body is elongate, with rounded extremities, 3.75 long and 0.83 wide, the length/breadth is 4.52:1. The tegument is smooth. Both suckers are round in shape, the oral sucker is subterminal; it measures 0.26 long and 0.25 wide, while the ventral sucker measures 0.50 long and 0.42 wide. The ratio between the oral sucker to ventral sucker diameters is 0.52:1. The ventral sucker lies 1.33 from anterior end of the body. The prepharynx is very short and

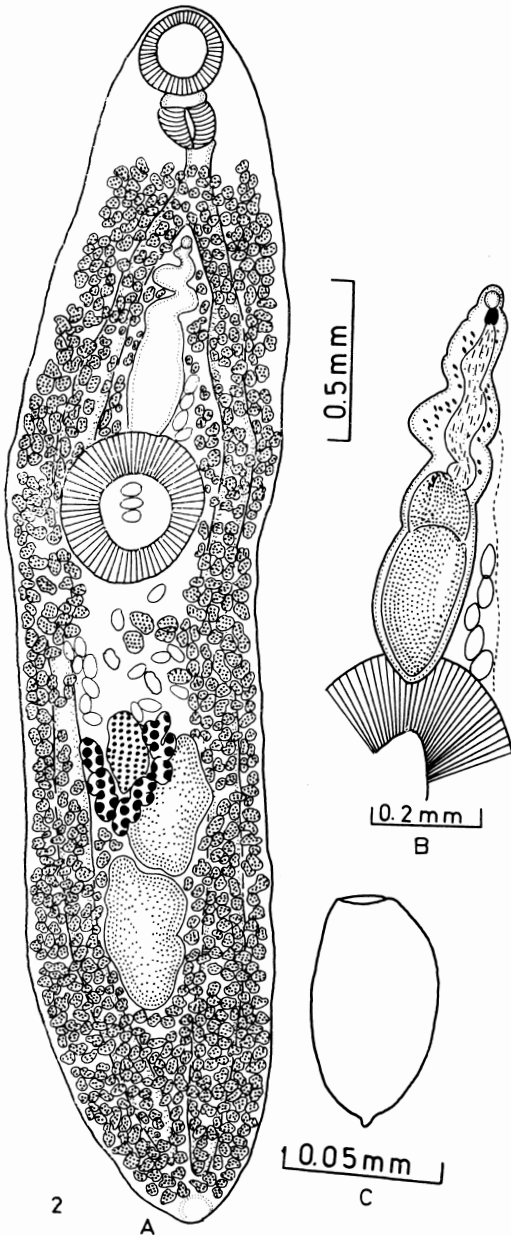


Fig. 2 *Hamacreadium ghardagense* n. sp.

- A—Ventral view.
 B—Terminal genitalia.
 C—Egg.

measures 0.04 long. The pharynx is well developed, round shaped and measures 0.16 in diameters. The pharynx leads to a short oesophagus, 0.13 long. The intestinal

caeca are thin, bifurcating typically inverted Y-shaped structure and extending to about the extreme end of the body.

The testes are elongated egg-shaped, slightly indented, diagonal, intercaecal and nearly in the third fourth of body length. The testes are nearly equal in size, the anterior testis measures 0.45 long and 0.21 wide and the posterior testis measures 0.47 long and 0.26 wide. The cirrus pouch is elongated, narrow and winding anteriorly, extending vertically between ventral sucker and intestinal bifurcation. It measures 0.52 long and 0.18 wide. It occupies posteriorly with compact vesicula seminalis, pars prostatica short, surrounded by few prostatic cells and leads to a short cirrus. The genital pore is submedian, just posterior to intestinal bifurcation and measures $20\ \mu$ in diameters.

The ovary is lobulated, intercaecal, consisting of irregular lobes arranged in the form of V-shaped; and found toward the right side of the anterior testis. The right wing of the ovary measures 0.32 long and 0.11 wide, while the left wing 0.42 long and 0.11 wide. A pear-shaped receptaculum seminis is found between the wings of ovarian lobes and measures 0.37 long and 0.13 wide. The vitellaria are composed of numerous small follicles which extend from oesophageal level to the posterior extremity of the body. The uterus lies anteriorly to the ovary and contains brownish to yellow coloured eggs. The eggs are oval in shape, operculated from one end and with small distinct process from the other end. The egg measures $68\ \mu$ long and $42\ \mu$ wide.

Discussion

Hamacreadium ghardagense n. sp. can be easily separated from other known species of the genus by its characteristic egg shape. It is the only species described so far with operculated egg from one end and with

small distinct process from the other end. It is also different from other species by the characteristic arrangement of the ovarian lobes in the form of V-shaped. *H. pterois* Nagaty and Abdel Aal, 1962, may be related to *H. ghardagense* n. sp., but they differ markedly in cirrus pouch shape, body shape and ovarian shape as well as the egg shape.

The author believes that all these dif-

ferences are sufficient to designate *Hamacreadium ghardagense* as a new species.

Host : *Variola louti*.
 Location : Intestine.
 Locality : Al-Ghardaga, Red Sea.
 Type : Deposited in the Helminthological Collection, Zoology Department, Faculty of Science, Ain Shams University, No: 323.

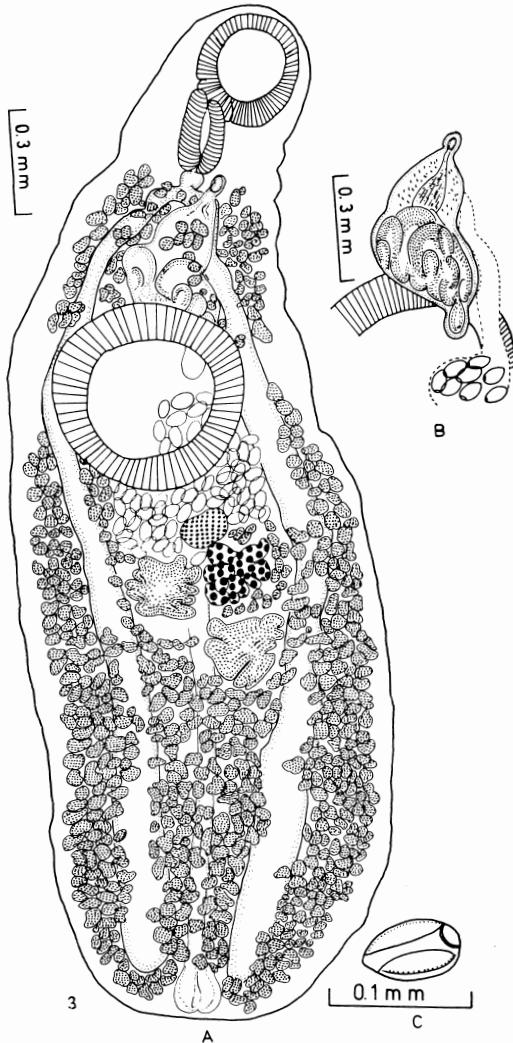


Fig. 3 *Hamacreadium khalili* n. sp.
 A—Ventral view.
 B—Terminal genitalia.
 C—Egg.

3. *Hamacreadium khalili* n. sp. * (Fig. 3)
 The following description is based on four specimens collected from *Lethrinus mahsena* locally called "Bonqs" and *L. nebulosus* locally called "Shuura" caught from Al-Ghardaga, Red Sea.

The body is elongate; anterior end distinctly narrower than the rest of the body. 1.70–3.10 long and 0.83–1.05 wide and the length/width ratio is 2.05–2.95:1. The tegument is slightly annulated. Both suckers are round in shape. The oral sucker is subterminal and measures 0.21–0.32 long and 0.23–0.31 wide and the ventral sucker measures 0.29–0.53 long and 0.37–0.51 wide. The ventral sucker lies 0.65–0.91 from anterior end of the body. The ratio between the oral sucker to ventral sucker diameters is 0.59–0.75:1. The prepharynx is very short and measures 0.02–0.04 long. The pharynx is oval in shape and measures 0.12–0.13 long and 0.08–0.10 wide. The pharynx is followed by a short oesophagus, measuring 0.05 long. The intestinal caeca are simple tubes that extend on both sides of the body and terminate very close to posterior end.

The testes are globular in shape, lobulated and obliquely situated in the middle third of the body. The anterior testis measures 0.18–0.26 long and 0.11–0.21 wide and the posterior one measures 0.18–

* The new species is named in the honour of the late Dr. M. Khalil, formerly, Professor of Parasitology, Cairo University for his distinguished contributions to parasitology in Egypt.

0.26 long and 0.10–0.18 wide. The cirrus pouch is large, triangular in shape, situated between the intestinal furca and its posterior end overlapped dorsally with the ventral sucker and measures 0.13–0.32 long and 0.12 wide. The cirrus pouch contains globular vesicula seminalis, short pars prostatica, well developed prostate gland and a stout cirrus and it opens on the genital pore which is found on the left side to the oesophagus.

The ovary is lobulated (6–9 lobes), globular in shape, lies toward the left side of the anterior testis and measures 0.16–0.21 long and 0.09–0.24 wide. There is a large oval shaped receptaculum seminis which is found anterior to the ovary and measures 0.11–0.13 long and 0.12–0.14 wide. The vitellaria are composed of small spheroid follicles that are aggregated in two sets, a posterior and an anterior, with a gap between them. The posterior set extends from the posterior end of the body to the posterior level of the ventral sucker and the anterior set extends anteriorly from the ventral sucker to the oesophagus level. The uterus lies between the ovary, anterior testis and the ventral sucker. The eggs are oval in shape, golden-yellowish in colour, provided with an operculum at one side, they measure 64–68 μ long and 37–41 μ wide.

The excretory pore is located at the posterior end of the body, the excretory bladder saccular in shape and its extension could not be traced anteriorly due to the density of vitelline glands.

Discussion

Hamacreadium khalili n. sp. only resembles *H. interruptum* Nagaty, 1941 in having interrupted vitellaria. However, the new species differs from it in the following points:

1–Lobulated testes and presence of intertesticular spaces.

2–Cirrus pouch triangular in shape and extending vertically and partly overlapped with the ventral sucker instead of tubular and transversely extending anterior to the ventral sucker.

3–The posterior set of vitellaria reach to the posterior margin of acetabulum while it is not in *H. interruptum*.

4–Round ventral sucker instead of triangular in *H. interruptum*.

5–Presence of a very short prepharynx.

As well as the differences in measurements of various internal organs.

The author believes that all these differences are sufficient to designate *Hamacreadium khalili* as a new species.

Hosts : *Lethrinus mahsena* and *L. nebulosus*.

Location : Intestine.

Locality : Al-Ghardaga, Red Sea.

Types : Deposited in the Helminthological Collection, Zoology Department, Faculty of Science, Ain Shams University, No: 324 and 325.

A key for the trematode species of the genus *Hamacreadium* Linton, 1910 known so far from the Red Sea fishes.

- 1–Vitellaria confined to the posterior half of the body
H. koshari Nagaty and Abdel Aal, 1962
 Vitellaria extend both anterior and posterior of the body 2
- 2–Vitellaria interrupted 3
 Vitellaria not interrupted 4
- 3–Testes spheroid and entire, cirrus pouch wide curved in shape and transversely situated .. *H. interruptum* Nagaty, 1941
 Testes globular and lobulated, cirrus pouch triangular in shape
 *H. khalili* n. sp.
- 4–Eggs with small process
 *H. ghardagense* n. sp.
 Eggs without process 5
- 5–Testes indented 6
 Testes smooth 7
- 6–Ovary with distinct lobes, tegument

- smooth
- H. nagatyi* (Nagaty and Abdel Aal, 1962)
Lamothe, 1962
- Ovary with compact lobes, tegument annulated
- H. nebulosae* Nagaty and Abdel Aal, 1962
- 7-Eggs operculated
- *H. mutabile* Linton, 1910
- Eggs not operculated
- H. caranxi* Saoud, Abu Sinna and Ramadan, 1977

Summary

A review of the genus *Hamacreadium* Linton, 1910 is presented. *H. balistes* is suggested as a synonym of *H. interruptum*. *H. mutabile* Linton, 1910 is briefly redescribed on the basis of new host records and new variations. *H. ghardagense* n. sp. from *Variola louti* and *H. khalili* n. sp. from *Lethrinus mahseni* and *L. nebulosus* are described. The new species are compared with other congeneric species and a key is presented to differentiate the species of the genus *Hamacreadium* known so far in the Red Sea fishes.

Acknowledgements

The author gratefully acknowledges the guidance and useful comments of Prof. Dr. Mary H. Pritchard, Professor of Parasitology, H. W. Manter Laboratory, University of Nebraska, U.S.A. and Prof. Dr. M. F. A. Saoud, Professor of Parasitology, Faculty of Science, Ain Shams University. Thanks are also due to the members of the Marine Biological Station at Al-Ghardaga, Red Sea, for sincere help in collection and identification of fishes.

References

- 1) Bilqees, F. M. and Masood, S. (1975): Two new trematode species of the genus *Hamacreadium* Linton, 1910 (Opecoelidae: Plagioporidae) from the Indian mackerel *Rastrelliger kanagurta* (Cuv.) off the Karachi Coast. *Norw. J. Zool.*, 23, 135-139.
- 2) Durio, W. O. and Manter, H. W. (1968): Some digenetic trematodes of marine fishes of New Caledonia. Part 11. Opecoelidae and Lepocreadiidae. *J. Parasitol.*, 54, 747-756.
- 3) Fischthal, J. H. and Kuntz, R. E. (1965): Di-

- genetic trematodes of fishes from North Borneo (Malaysia). *Proc. Helminth. Soc. Wash.*, 32, 63-71.
- 4) Lamothe, A. R. (1962): Redescription de dos tremátodos digéneos de peces del pacífico mexicano. *An. Inst. Biol. Méx.*, 33, 97-111.
 - 5) Linton, E. (1910): Helminth fauna of the Dry Tortugas. II Trematodes. *Carn. Inst. Wash.*, No. 133, 98 pp.
 - 6) Manter, H. W. (1947): The digenetic trematodes of marine fishes of Tortugas, Florida. *Amer. Midi. Nat.*, 38, 257-416.
 - 7) Manter, H. W. (1963): Studies on digenetic trematodes of Fiji. II. Families Lepocreadiidae, Opitholebetidae. *J. Parasitol.*, 49, 99-113.
 - 8) Mehra, H. R. (1966): Revision of Allocreadioidea Nicoll, 1934. Part II Opecoelidae Ozaki, 1925, Opitholebetidae Fukui, 1929, Allocreadiidae Stossich, 1903, Bunoderidae Nicoll, 1914, Acanthoclopidae Lühe, 1909 and Pleorchiidae Poche, 1925. *Publ. by author*, 1-46.
 - 9) Nagaty, H. F. (1941): Trematodes of fishes from the Red Sea. II. The genus *Hamacreadium* Linton, 1910 (Fam. Allocreadiidae), with a description of two new species. *J. Roy. Egypt. Med. Assoc.*, 24, 300-310.
 - 10) Nagaty, H. F. and Abdel Aal, T. M. (1962): Trematodes of fishes from the Red Sea. Part 15. Four new species of *Hamacreadium* Family Allocreadiidae. *J. Parasitol.*, 48, 384-386.
 - 11) Nagaty, H. F. and Abdel Aal, T. M. (1962): Trematodes of fishes from the Red Sea. Part 16. On three new species of *Hamacreadium* (Family: Allocreadiidae). *J. Arab Vet. Med. Assoc.*, 22, 301-305.
 - 12) Nicoll, W. (1909): Studies on the structure and classification of the digenetic trematodes. *Quart. J. Micr. Sci.*, 53, 391-487.
 - 13) Parukhin, A. M. (1970): Study of the trematode fauna of fish in the Red Sea and Gulf of Aden. *Biologiya Marya, Kiev*, 20, 187-213.
 - 14) Pritchard, M. H. (1966): A revision of the genus *Podocotyle* (Opecoelidae). *Zool. Jahrb. Syst.*, 93, 158-172.
 - 15) Ramadan, M. M. (1982): A review of the trematode genus *Rhagorchis* Manter 1931 (Lepocreadiidae), with a description of *Rhagorchis manteri* sp. nov., an intestinal parasite of Scarid fish from the Red Sea. *Z. Parasitenkd.*, 67, 273-277.
 - 16) Saoud, M. F. A., Abu Sinna, H. and Ramadan, M. M. (1977): On *Hamacreadium caranxi* n. sp. (Trematoda: Allocreadiidae); an intestinal parasite of a perciform fish from the Red Sea. *J. Egypt Soc. Parasite.*, 7, 181-186.
 - 17) Skrjabin, K. I. (1964): Keys to the trematodes

- of animals and man. University of Illinois Press, Urbana, U.S.A., 351 pp.
- 18) Yamaguti, S. (1934): Studies on the helminth fauna of Japan. Part 2. Trematodes of fishes, I. Jpn. J. Zool., 5, 249-541.
- 19) Yamaguti, S. (1958): Systema helminthum. I.

The digenetic trematodes of vertebrates. Interscience. Publ., 1-979.

- 20) Yamaguti, S. (1971): Synopsis of digenetic trematodes of vertebrates, Vol. I Keigaku Publishing Co., Tokyo, 1074 pp.

***Hamacreadium* Linton, 1910 (Opcoelidae) 属吸虫の総説ならびに紅海の魚類から
検出されたそれら 2 新種について**

M. M. RAMADAN

(Department of Biology, Ain Shams University, Cairo, Egypt)

Hamacreadium 属の吸虫についてその総説をのべた。 *H. balitesi* は *H. interruptum* の synonym とすることを提案した。

さらに *H. mutabile* Linton 1910 の新宿主と変異について簡単に再記載した。

また *Variola louti* から *H. ghardagense* n. sp.

が *Lethrinus mahsena* や *L. nebulosus* から *H. khalili* n. sp. が検出された。これら新種は他の関連種と比較し、紅海の魚類から現在まで検出されている *Hamacreadium* 属の各種との区別のための key をのべた。