AN UPDATED LIST OF Monogenoidea FROM MARINE FISHES OF VIETNAM

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Received 11 February 2020, accepted 16 April 2020

ABSTRACT

In this paper, we updated the list of monogenean species from marine fishes of Vietnam. Taxonomic position of monogenean species were arranged according to the current classification system. A total of 220 monogenean species from 152 marine fish species were listed. Distribution, hosts and references of each species were given. In addition, amendments of taxonomic status of taxa were also updated.

Keywords: Monogenoidea, marine fishes, East Sea, Gulf of Tonkin, Vietnam.

Citation: Nguyen Manh Hung, Nguyen Van Ha, Ha Duy Ngo, 2020. An updated list of Monogenoidea from marine fishes of Vietnam. Academia Journal of Biology, 42(2): 1–27. https://doi.org/10.15625/2615-9023/v42n2.14819.

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INTRODUCTION

The study of monogeneans from marine fishes in Vietnam began in the 1950s when few intensive surveys were undertaken by the cooperation between Vietnam and Soviet Union parasitologists (Bychowsky & Nagibina, 1954, 1959). The results of these studies were published by the Soviet helminthologists in Russian between 1961–1989 in a series of more than 30 papers. In addition, a large number of new genera and species were described and constitute much of the basis of our knowledge of monogenea fauna of marine fish in Vietnam and Southeast Asia. In 2006, Arthur & Bui listed 55 monogenetic species from marine fishes. However, the list did not count many species which are present in some documents, such as Bychowsky & Nagibina (1954, 1959, 1967, 1968, 1969a, 1969b, 1971, 1974, 1975a, 1975b, 1976, 1977), Bychowsky et al. (1976), Guseve (1967, 1973, 1985), Timofeeva (1989), Egorova & Korotaeve (1990), Egorova (2000). Moreover, many publications after 2006, e.g. Vo et al. (2010), Nguyen (2012), Dang et al. (2010, 2013), Dmitrieva et al. (2018), Kritsky et al. (2016) and Nguyen et al. (2016), added 35 species for monogenean fauna in Vietnam.

This paper updated all monogenean species from marine fishes of Vietnam and arranged them to the current classification system.

MATERIALS AND METHODS

A total of 83 references relating to monogeneans from marine fishes of Vietnam were retrieved for this study. The taxa of monogeneans in the results part below were arranged following the classification system which was proposed by Bychowsky (1937) and revised by Boeger & Kritsky (1993). The scientific name of monogeneans was checked and corrected according to the database of the World register of marine species (WoRMS, 2020). Similarly, the scientific name of marine fish hosts was updated following the database of the FishBase (https://www.fishbase.in/search.php). In the list, the taxon levels, i.e. subfamilies, genera and species, were arranged in alphabetical order.

RESULTS

A total of 220 monogenetic species were found from 152 marine fish species. These monogeneans are belonging to 108 genera, 24 families, 5 orders, and 2 subclasses. The list of monogeneans below contains information about its taxonomical position, host species and distribution, and reference sources.

CLASS MONOGENOIDEA
BYCHOWSKY, 1937

SUBCLASS POLYONCHOINEA
BYCHOWSKY, 1937

Order CAPSALIDEA Lebedev, 1988
Family Capsalidae Baird, 1853
Genus Allobenedenia Yamaguti, 1963
1. A. epinepheli (Bychowsky & Nagibina, 1967) Yang, Kritsky & Sun, 2004
Syn. Megalocotyloides epinepheli Bychowsky & Nagibina, 1967
Vo et al., 2010: 39; Nguyen, 2012: 34
Host: Malabar grouper Epinephelus malabaricus
Distribution: Gulf of Tonkin

2. A. yamagutii (Egorova, 1994) Yang, Kritsky & Sun, 2004
Syn. Megalocotyloides yamagutii Egorova, 1994
Vo et al., 2010: 39; Nguyen, 2012: 34
Host: Warsaw grouper Hyporthodus nigritus (syn. Epinephelus nigritus) *
Distributions: Nha Trang bay; Ha Long bay

Genus Benedenia Diesing, 1858
1. B. epinepheli (Yamaguti, 1937) Meserve, 1938
Vo et al., 2010: 38
Hosts: Duskytail grouper Epinephelus bleekeri, longtooth grouper E. bruneus; malabar grouper E. malabaricus, sixbar grouper E. sexfasciatus, greasy grouper E.
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3. tauvina, warsaw grouper *Hyporthodus nigritus*
   Distribution: Gulf of Tonkin
   Genus *Capsala* Bosc, 1811 (Syn. *Caballerocotyla* Price, 1960)
   4. *C. affinis* (Mamaev, 1968)
   Syns. *Caballerocotyla manteriaffinis* Mamaev, 1968; *Capsala manteriaffinis*
   Chisholm & Whittington, 2007
   Mamaev, 1968: 9
   Hosts: Kawakawa *Euthynnus affinis*; Atlantic bluefin tuna *Thunnus thynnus*
   Distribution: Gulf of Tonkin
   5. *C. notosinense* (Mamaev, 1968)
   Chisholm & Whittington, 2007
   Syn. *Caballerocotyla notosinense* Mamaev, 1968
   Mamaev, 1968: 10
   Host: Kawakawa *E. affinis*
   Distribution: Gulf of Tonkin
   6. *C. paucispinosa* (Mamaev, 1968)
   Chisholm & Whittington, 2007
   Syn. *Caballerocotyla paucispinosa* Mamaev, 1968
   Mamaev, 1968: 12
   Hosts: Kawakawa *E. affinis*, Atlantic bluefin tuna *T. thynnus*
   Distribution: Gulf of Tonkin
   Genus *Encotyllabe* Diesing, 1850
   7. *E. spari* Yamaguti, 1934
   Mamaev, 1970: 139
   Host: Grey large-eye bream *Gymnocranius griseus*
   Distribution: Gulf of Tonkin
   Genus *Megalocotyle* Folda, 1928
   8. *M. lutiani* Lebedev, 1970
   Lebedev, 1970: 193
   Host: Bigeye snapper *Lutjanus lutjanus*
   Distribution: Gulf of Tonkin
   Genus *Neobenedenia* Yamaguti, 1963

9. *N. melleni* (MacCallum, 1927)
   Yamaguti, 1963
   Vo et al., 2010: 41
   Hosts: Duskytail grouper *Epinephelus bleekeri*, malabar grouper *E. malabaricus*, warsaw grouper *Hyporthodus nigritus*
   Distribution: Nha Trang bay
   Genus *Sessilorbis* Mamaev, 1970
   10. *S. limopharynx* Mamaev, 1970
   Mamaev, 1970: 133
   Host: Orbicular batfish *Platax orbicularis*
   Distributions: Gulf of Tonkin
   Genus *Sprostoniella* Bychowsky & Nagibina, 1967
   11. *S. multitestis* Bychowsky & Nagibina, 1967
   Bychowsky & Naginina, 1967: 521
   Host: Orbicular batfish *P. orbicularis*
   Distributions: Gulf of Tonkin, South Central coast
   Genus *Trilobiodiscus* Bychowsky & Nagibina, 1967
   12. *T. lutiani* Bychowsky & Nagibina, 1967
   Bychowsky & Naginina, 1967: 525
   Host: Mangrove red snapper *Lutjanus argentimaculatus*
   Distribution: Gulf of Tonkin
   Genus *Trochopus* Diesing, 1850
   13. *T. antigoniae* Egorova & Korotaeva, 1990
   Egorova & Korotaeva, 1990: 443
   Host: Indo-Pacific boarfish *Antigonia rubescens*
   Distributions: Gulf of Tonkin, South Central coast

Family Dionchidae Johnston & Tiegns, 1922

Genus *Dionclus* Goto, 1899
14. *D. bychowskyi* Timofeeva, 1989
Timofeeva, 1989: 59
Host: Cobia *Rachycentron canadum*
Distribution: Gulf of Tonkin
15. *D. major* Egorova, 2000
Timofeeva, 2000: 257
Host: Cobia *R. canadum*
Distribution: Gulf of Tonkin
16. *D. minor* Timofeeva, 1989
Timofeeva, 1989: 62
Host: Live sharksucker *Echeneis naucrates*
Distribution: Gulf of Tonkin
17. *D. nagibinae* Timofeeva, 1989
Timofeeva, 1989: 64
Host: Cobia *R. canadum*
Distributions: Gulf of Tonkin, South Central coast
18. *D. orientalis* Timofeeva, 1989
Timofeeva, 1989: 57
Host: Live sharksucker *E. naucrates*
Distribution: Gulf of Tonkin
19. *D. sinensis* Timofeeva, 1989
Timofeeva, 1989: 65
Host: Live sharksucker *E. naucrates*
Distribution: Gulf of Tonkin
Order DACTYLOGYRIDEA Bychowsky, 1937
Family Calceostomatidae Parona & Perugia, 1890
Genus *Bychowskya* Nagibina, 1968
20. *B. drepanae* Nagibina, 1968
Nagibina, 1968: 289
Host: Spotted sicklefish *Drepane punctate*
Distribution: Gulf of Tonkin
Genus *Dicrumenia* Mamaev, 1969
21. *D. bychowskii* Mamaev, 1969
Mamaev, 1969: 170
Host: Saddle grunt *Pomadasys maculatus*
Distribution: Gulf of Tonkin

Family DACTYLOGYRidae Bychowsky, 1933
Genus *Ancyrocephaloides* Yamaguti, 1938
22. *A. chauhani* Bychowsky & Nagibina, 1975
Bychowsky & Nagibina, 1975a: 70
Host: Short-nosed tripodfish *Triacanthus brevirostris*
Distribution: Gulf of Tonkin
Genus *Ancyrocephalus* Creplin, 1839
23. *A. macrogaster* Yamaguti, 1953
Mamaev, 1970: 131
Host: Whipfin silver-biddy *Gerres filamentosus*
Distribution: Gulf of Tonkin
24. *A. parspinicirrus* Mamaev, 1970
Mamaev, 1970: 129
Host: Spotted sicklefish *Drepane punctate*
Distribution: Gulf of Tonkin
25. *A. unicirrus* Tripathi, 1959
Mamaev, 1970: 133
Host: Silver grunt *Pomadasys hasta*
Distribution: Gulf of Tonkin
Genus *Atherinicus* Bychowsky & Nagibina, 1969
26. *A. cornutus* Bychowsky & Nagibina, 1969
Bychowsky & Nagibina, 1969b: 523
Host: Red Sea hardyhead silverside *Atherina forskali*
Distribution: Gulf of Tonkin
Genus *Bravohollisia* Bychowsky & Nagibina, 1970
27. *B. magna* Bychowsky & Nagibina, 1970
Bychowsky & Nagibina, 1970a: 22
Host: Silver grunt *Pomadasys hasta*
Distributions: Gulf of Tonkin, South Central coast
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28. *B. pomadasis* Bychowsky & Nagibina, 1970
   Bychowsky & Nagibina, 1970a: 21
   Hosts: Silver grunt *P. hasta*; saddle grunt *P. maculatus*
   Distribution: Gulf of Tonkin, South Central coast

29. *B. tecta* Bychowsky & Nagibina, 1970
   Bychowsky & Nagibina, 1970a: 20
   Host: Saddle grunt *P. maculatus*
   Distribution: Gulf of Tonkin, South Central coast

Genus *Caballeria* Bychowsky & Nagibina, 1970

30. *C. pedunculata* Bychowsky & Nagibina, 1970
   Bychowsky & Nagibina, 1970a: 23
   Host: Silver grunt *P. hasta*
   Distributions: Gulf of Tonkin, South Central coast

31. *C. robusta* Bychowsky & Nagibina, 1970
   Bychowsky & Nagibina, 1970a: 24
   Host: Saddle grunt *P. maculatus*
   Distributions: Gulf of Tonkin, South Central coast

Genus *Chauhanellus* Bychowsky & Nagibina, 1969

32. *C. flexiosus* Bychowsky & Nagibina, 1968
   Bychowsky & Nagibina, 1969a: 365
   Host: Smooth-headed catfish *Arius leiotetocephalus*
   Distributions: Gulf of Tonkin, South Central coast

33. *C. oculatus* Bychowsky & Nagibina, 1968
   Bychowsky & Nagibina, 1969a: 364
   Host: Smooth-headed catfish *A. leiotetocephalus*

   Distributions: Gulf of Tonkin, South Central coast

Genus *Dactylogyrus* Diesing, 1850

34. *D. gotoi* Gussev, 1965
   Gussev, 1967: 251
   Host: Japanese seabass *Lateolabrax japonicus*
   Distribution: Gulf of Tonkin

35. *D. inversus* Goto & Kikuchi, 1917
   Gussev, 1967: 251
   Host: Japanese seabass *L. japonicus*
   Distribution: Gulf of Tonkin

36. *D. kikuchii* Gussev, 1965
   Gussev, 1967: 252
   Host: Japanese seabass *L. japonicus*
   Distribution: Gulf of Tonkin

Genus *Diversohamulus* Bychowsky & Nagibina, 1969

37. *D. tricuspidatus* Bychowsky & Nagibina, 1969
   Bychowsky & Nagibina, 1969b: 525
   Host: Sumatran silverside *Atherina bleeker*
   Distribution: Gulf of Tonkin

Genus *Euryhaliotrema* Kritsky & Boeger, 2002

38. *E. johni* (Tripathi, 1959) Kritsky & Boeger, 2002
   Kritsky & Boeger, 2002: 30; Nguyen, 2012: 28
   Hosts: Blacktail snapper *L. fulvus*, bigeye snapper *L. lutjanus*, russell's snapper *L. russelli*, blackhead seabream *Acanthopagrus schlegelii*
   Distribution: Ha Long bay

Genus *Halietrema* Johnston & Tiegs, 1922

39. *H. ampliocuspidis* Bychowsky & Nagibina, 1971
   Bychowsky & Nagibina, 1971: 28
Host: Common ponyfish *Leiognathus equulus*
Distribution: Gulf of Tonkin
40. *H. australie* Bychowsky & Naginina, 1970
Bychowsky & Naginina, 1970b: 1791
Host: Indian goatfish *Parupeneus indicus*
Distribution: Gulf of Tonkin
41. *H. bilobatum* (Yamaguti, 1953)
Bychowsky & Naginina, 1970
Hosts: Warsaw grouper *Hyporthodus nigritus*; spotted sicklefish *Drepane punctate*
Distribution: Gulf of Tonkin
42. *H. cromileptis* Young, 1968
Vo et al., 2010: 35
Host: Warsaw grouper *H. nigritus*
Distribution: Gulf of Tonkin
43. *H. epinepheli* Young, 1968
Vo et al., 2010: 34
Hosts: Areolate grouper *Epinephelus areolatus*, yellow grouper *E. awoara*, duskytail grouper *E. bleekeri*, Hong Kong grouper *E. akaara*, sixbar grouper *E. sexfasciatus*; red seabream *Pagrus major* (Syn. *Pagrosomus major*); goldlined seabream *Rhabdosargus sarba*
Distribution: Gulf of Tonkin, South Central coast
44. *H. flagellocirrus* Bychowsky & Naginina, 1970
Bychowsky & Naginina, 1970b: 1794
Host: sweepers *Pempheris molucca*
Distribution: Gulf of Tonkin
45. *H. geminatohamula* Bychowsky & Naginina, 1971
Bychowsky & Naginina, 1971: 1796
Host: Spotnape ponyfish *N. muchalis*
Distribution: Gulf of Tonkin
46. *H. holocentri* Young, 1968
Bychowsky & Naginina, 1970b: 1793
Host: Redcoat Redcoat *Sargocentron rubrum* (syn. *Holocentrus ruber*)
Distribution: Gulf of Tonkin
47. *H. johnstonii* Bychowsky & Naginina, 1970
Bychowsky & Naginina, 1970b: 1798
Host: Freckled goatfish *Upeneus tragula*
Distribution: Gulf of Tonkin
48. *H. magnihamus* Bychowsky & Naginina, 1970
Bychowsky & Naginina, 1970b: 1797
Host: Spotted sicklefish *Drepane punctate*
Distribution: Gulf of Tonkin
49. *H. neobilobatus* Bychowsky & Naginina, 1970
Bychowsky & Naginina, 1970b: 1795
Host: Spotted sicklefish *D. punctate*
Distribution: Gulf of Tonkin
50. *H. spinicirrus* (Yamaguti, 1953)
Bychowsky & Naginina, 1970
Syn. *Ancyrocephalus spinicirrus* Yamaguti, 1953
Mamaev, 1970: 129; Nguyen, 2012: 31
Hosts: Spotted sicklefish *D. punctate*; Japanese scad *Decapterus maruadsi*
Distribution: Gulf of Tonkin
51. *H. subtilihamula* Bychowsky & Naginina, 1971
Bychowsky & Naginina, 1971: 32
Host: Toothpony *Gazza minuta*
Distribution: Gulf of Tonkin
52. *H. surculocirrus* Bychowsky & Naginina, 1971
Bychowsky & Naginina, 1971: 34
Host: Striped ponyfish *Aurigequula fasciata* (syn. *Leiognathus fasciatus*)
Distribution: Gulf of Tonkin
53. *H. parvihamus* Bychowsky & Naginina, 1970
Bychowsky & Naginina, 1970b: 38
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54. *H. pempherii* Bychowsky & Nagibina, 1970
   Bychowsky & Naginina, 1970b: 36
   Host: Sweepers *Pempheris molucca*
   Distribution: Gulf of Tonkin

55. *H. platycephali* Yin & Sproston, 1948
   Nguyen, 2012: 30
   Host: Bartail flathead *Platycephalus indicus*
   Distribution: Gulf of Tonkin

56. *H. tenucirrus* Bychowsky & Nagibina, 1971
   Bychowsky & Naginina, 1970b: 37
   Host: Common ponyfish *L. equulus*
   Distribution: Gulf of Tonkin

57. *H. tiegsi* Bychowsky & Nagibina, 1970
   Bychowsky & Naginina, 1970b: 38
   Host: Freckled goatfish *U. tragula*
   Distribution: Gulf of Tonkin

Genus *Haliotrema* Kritsky, Yang & Sun, 2009
58. *H. calcaris* (Bychowsky & Nagibina, 1971) Kritsky, Yang & Sun, 2009
   Bychowsky & Nagibina, 1971: 34
   Host: sniper *Lutjanus* sp.
   Distribution: Gulf of Tonkin

59. *H. longitubocirrus* (Bychowsky & Nagibina, 1971) Kritsky, Yang & Sun, 2009
   Bychowsky & Nagibina, 1971: 36
   Hosts: Bigeye snapper *L. lutjanus*, brownstripe red snapper *L. vitta*
   Distribution: Gulf of Tonkin

60. *H. noncalcaris* (Bychowsky & Nagibina, 1971) Kritsky, Yang & Sun, 2009
   Bychowsky & Nagibina, 1971: 35
   Host: Mangrove red snapper *L. argentimaculatus*
   Distribution: Gulf of Tonkin

61. *H. patellacirrus* (Bychowsky & Nagibina, 1971) Kritsky, Yang & Sun, 2009
   Bychowsky & Nagibina, 1971: 37
   Hosts: Bigeye snapper *L. lutjanus*, dory snapper *L. fulviflammus*
   Distribution: Gulf of Tonkin

Genus *Hamatopeduncularia* Yamaguti, 1953
62. *H. arii* Yamaguti, 1953
   Bychowsky & Nagibina, 1969a: 357
   Host: Smooth-headed catfish *Arius leiotetecophilus*
   Distribution: Gulf of Tonkin

63. *H. elegans* Bychowsky & Nagibina, 1968
   Bychowsky & Nagibina, 1969a: 362
   Host: Smooth-headed catfish *A. arius*
   Distribution: Gulf of Tonkin

64. *H. simplex* Bychowsky & Nagibina, 1969
   Bychowsky & Nagibina, 1969a: 361
   Host: Smooth-headed catfish *A. arius*
   Distribution: Gulf of Tonkin

65. *H. thalassini* Bychowsky & Nagibina, 1969
   Bychowsky & Nagibina, 1969a: 361
   Host: Smooth-headed catfish *A. arius*
   Distribution: Gulf of Tonkin

Genus *Hemirhamphiculus* Bychowsky & Nagibina, 1969
66. *H. armatus* Bychowsky & Nagibina, 1969
   Bychowsky & Nagibina, 1969b: 518
   Host: Black-barred halibeak *Hyporhamphus far* (syn. *Hemiramphus far*)
   Distribution: Gulf of Tonkin

67. *H. similis* Bychowsky & Nagibina, 1969
   Bychowsky & Nagibina, 1969b: 519
Host: Dussumier's halfbeak

Hyporhamphus dusssumieri (syn. Hemiramphus dusssumieri)

Distribution: Gulf of Tonkin

Genus *Ligophorus* Euzet & Suriano, 1977

68. *L. fenestrum* Soo & Lim, 2012

Dmitrieva et al., 2018: 72

Hosts: Bluespot mullet *Crenimugil seheli* (syn. *Moolgarda seheli*), largescale mullet *Planiliza macrolepis*, otomebora mullet *P. melinopterus*, mullet *Valamugil formosae*, speigler's mullet *V. speigleri*

Distributions: Gulf of Tonkin; South Central coast

69. *L. hamulosus* Pan et Zhang, 1999

Nguyen, 2012: 26

Hosts: bluespot mullet *Crenimugil seheli*; kanda *Osteomugil engeli* (syn. *Valamugil engeli*)

Distribution: Gulf of Tonkin

70. *L. leporinus* (Zhang & Ji, 1981) Gussev, 1985

Gussev, 1985: 128; Nguyen, 2012: 28

Hosts: Bluespot mullet *Crenimugil seheli*, squaretail mullet *Ellchoelon vaigiensis*, flathead grey mullet *Mugil cephalus*, kanda *Osteomugil engeli*, largescale mullet *Planiliza macrolepis* (syn. *Liza macrolepis*), eastern keelback mullet *P. affinis* (syn. *L. affinis*)

Distributions: Gulf of Tonkin; South Central coast

71. *L. macrocolpos* Euzet & Suriano, 1977

Te, 1998: 5; Arthur & Bui, 2006: 46

Host: Flathead grey mullet *Mugil cephalus*

Distribution: Gulf of Tonkin

Genus *Lobotrema* Tripathi, 1959

72. *L. sciaenae* (Bychowsky & Nagibina, 1977) Oliver, 1987

Syn. *Allomurraytrema sciaennae* Bychowsky & Nagibina, 1977

Bychowsky & Nagibina, 1977: 14

Hosts: Sin croaker *Johnius dusssumieri* (syn. *Sciaena dusssumieri*), belanger's croaker *J. belengri*, yellow drum *Nibea albiflora*

Distributions: Gulf of Tonkin; South Central coast

73. *L. argyrosomi* (Bychowsky & Nagibina, 1977) Oliver, 1987

Syn. *Allomurraytrema argyrosomi* Bychowsky & Nagibina, 1977

Bychowsky & Nagibina, 1977: 12

Host: Amoy croaker *Argyrosomus amoyensis*

Distributions: Gulf of Tonkin; South Central coast

Genus *Metahaliotrema* Yamaguti, 1953

74. *M. kulkarnii* Venkatanarasiah, 1981

Kritsky et al., 2016: 330

Host: Spotted scat *Scatophagus argus*

Distributions: Gulf of Tonkin; South Central coast

75. *M. mizellei* Venkatanarasiah, 1981

Nguyen, 2012: 33; Kritsky et al., 2016: 326

Host: Spotted scat *S. argus*

Distributions: Gulf of Tonkin; vinh Thái Lan

76. *M. scatophagi* Yamaguti, 1953

Kritsky et al., 2016: 324

Host: Spotted scat *S. argus*

Distributions: Gulf of Tonkin; vinh Thái Lan

77. *M. similis* Kritsky, Nguyen, Ha & Heckman, 2016

Kritsky et al., 2016: 332

Host: Spotted scat *S. argus*

Distributions: Gulf of Tonkin

78. *M. cf. yamagutii* Mizelle & Price, 1964

Kritsky et al., 2016: 333

Host: Spotted scat *S. argus*

Distribution: Gulf of Tonkin
79. *M. ypsilocleithrum* Kritsky, Nguyen, Ha & Heckman, 2016
   Kritsky et al., 2016: 328
   Host: Spotted scat *S. argus*
   Distributions: Gulf of Tonkin; vịnh Thái Lan

Genus *Paradiplectanotrema* Gerasev, Gayevskaya & Kovaleva, 1987
80. *P. trachuri* (Kovaljova, 1970)
   Gerasev, Gayevskaya & Kovaleva, 1987
   Nguyen, 2012: 34
   Hosts: Japanese meagre *Argyrosomus japonicus*, carouin croaker *Joannius carouna*
   Distribution: Gulf of Tonkin

Genus *Parahemirhamphiculus* Bychowsky & Nagibina, 1969
81. *P. pinguis* Bychowsky & Nagibina, 1969
   Bychowsky & Nagibina, 1969b: 521
   Hosts: Black-barred halfbeak
   Distribution: Gulf of Tonkin

Genus *Platycephalotrema* Kritsky & Nitta, 2019
82. *P. macassarense* (Yamaguti, 1963)
   Kritsky & Nitta, 2019
   Bychowsky & Nagibina, 1971: 38
   Host: Bartail flathead *Platycephalus indicus*
   Distributions: Gulf of Tonkin
83. *P. thysanophrydis* (Yamaguti, 1937)
   Kritsky & Nitta, 2019
   Bychowsky & Nagibina, 1971: 39
   Hosts: Japanese flathead *Inegocia japonica* (syn. *Thysanophrys japonicus*)
   Distribution: Gulf of Tonkin

Genus *Protogyrodactylus* Johnston & Tieg, 1922
84. *P. alienus* Bychowsky & Nagibina, 1974
   Bychowsky & Nagibina, 1974: 477
   Hosts: Whipfin silver-biddy *Gerres filamentosus*; saddleback silver-biddy *G. limbatus* (syn. *G. lucidus*)
   Distribution: Gulf of Tonkin
85. *P. delicatus* Bychowsky & Nagibina, 1974
   Bychowsky & Nagibina, 1974: 478
   Host: Saddleback silver-biddy *G. limbatus*
   Distribution: Gulf of Tonkin
86. *P. gussevi* Bychowsky & Nagibina, 1974
   Bychowsky & Nagibina, 1974: 473
   Host: Jarbua terapon *Terapon jarbua*
   Distribution: Gulf of Tonkin
87. *P. elegantis* Bychowsky & Nagibina, 1974
   Bychowsky & Nagibina, 1974: 481
   Host: Deep-bodied mojarra *G. erythrourus*
   Distribution: Gulf of Tonkin
88. *P. fissilis* Bychowsky & Nagibina, 1974
   Bychowsky & Nagibina, 1974: 481
   Host: Slender silver-biddy *G. oblongus* (syn. *G. macrosoma*)
   Distribution: Gulf of Tonkin
89. *P. marinoides* Bychowsky & Nagibina, 1974
   Bychowsky & Nagibina, 1974: 476
   Host: Jarbua terapon *T. jarbua*
   Distribution: Gulf of Tonkin
90. *P. marinus* Gussev, 1973
   Gussev, 1973: 17
   Host: Jarbua terapon *T. jarbua*
   Distribution: Gulf of Tonkin
91. *P. perforatus* Bychowsky & Nagibina, 1974
   Bychowsky & Nagibina, 1974: 476
   Host: Jarbua terapon *T. jarbua*
   Distribution: Gulf of Tonkin
92. *Protogyrodactylus scapulasser* (Mamaev, 1970) Gussev, 1973
Syn. *Ancyrocephalus scapulasser* Mamaev, 1970
Mamaev, 1970: 131; Gussev, 1973: 23
Host: Whipfin silver-biddy *G. filamentosus*
Distribution: Gulf of Tonkin

93. *P. solidus* Bychowsky & Nagibina, 1974
Bychowsky & Nagibina, 1974: 475
Host: Jarbua terapon *T. jarbua*
Distribution: Gulf of Tonkin

94. *P. sprostonae* Bychowsky & Nagibina, 1974
Bychowsky & Nagibina, 1974: 479
Hosts: Deep-bodied mojarra *G. erythorum*, slender silver-biddy *G. oblongus* (syn. *G. macrosoma*)
Distribution: Gulf of Tonkin

95. *P. youngi* Bychowsky & Nagibina, 1974
Bychowsky & Nagibina, 1974: 480
Host: Slender silver-biddy *G. oblongus*
Distribution: Gulf of Tonkin

Genus *Triacanthinella* Bychowsky & Nagibina, 1968
96. *T. principalis* Bychowsky & Nagibina, 1968
Bychowsky & Nagibina, 1968: 154
Host: Short-nosed tripodfish *Triacanthus biaculeatus*
Distribution: Gulf of Tonkin

97. *T. tripathi* Bychowsky & Nagibina, 1968
Bychowsky & Nagibina, 1968: 157
Host: Long-spined tripodfish *Pseudotriacanthus strigilifer*
Distribution: Gulf of Tonkin

Family *Diplectanidae* Monticelli, 1903
Genus *Calydiscoides* Young, 1969

98. *C. flexuosus* (Yamaguti, 1953) Young, 1969
Nguyen, 2012: 36
Host: Japanese threadfin bream *Nemipterus japonicus*

Distribution: Ha Long bay
Genus *Diplectanum* Diesing, 1858
99. *D. spiralis* Nagibina, 1976
Nagibina, 1976: 88
Host: Dory snapper *Lutjanus fulviflamma*
Distribution: Gulf of Tonkin

100. *D. stetoxus* Nagibina, 1976
Nagibina, 1976: 93
Host: Waigieu seaperch *Psammoperca waigiensis*

Distribution: Gulf of Tonkin
101. *D. veropolynemi* Nagibina, 1976
Nagibina, 1976: 89
Host: Blackspot threadfin *Polydactylus sextarius* (syn. *Polynemus sextarius*)

Distribution: Gulf of Tonkin
Genus *Laticola* Yang, Kritsky, Sun, Zhang, Shi & Agrawal, 2006
102. *L. paralatesi* (Nagabina, 1976) Yang, Kritsky, Sun, Zhang, Shi & Agrawal, 2006
Syn. *Diplectanum paralatesi* Nagabina, 1976
Nagibina, 1976: 91
Hosts: Barramundi *Lates calcarifer*; blackspot threadfin *Polydactylus sextarius*

Distribution: Gulf of Tonkin
Genus *Murraytrema* Price, 1937
103. *M. pricei* Bychowsky & Nagibina, 1977
Nguyen, 2012: 39
Host: Yellow drum *Nibea albiflora*
Distribution: Ha Long bay
Genus *Murraytrematoides* Yamaguti, 1958
104. *M. bychowskii* (Nagibina, 1976)
Oliver, 1987
Nagibina, 1976: 94
Host: Striped threadfin *Polydactylus plebeius* (syn. *Polyenmus plebeius*)
Distribution: Gulf of Tonkin

Genus *Paradiplectanum* Domingues & Boeger, 2008
105. *P. blairense* (Gupta & Khanna, 1974)
Domingues & Boeger, 2008
Syn. *Diplectanum blairense* Gupta & Khanna, 1974
Nguyen, 2012: 34
Hosts: Silver sillago *Sillago sihama*; Japanese sillago *S. japonica*
Distribution: Ha Long bay

Genus *Pseudodiplectanum* Tripathi, 1957
106. *P. bychowskyi* Nagibina, 1977
Nagibina, 1977: 86
Host: Fourlined tonguesole *Cynoglossus bilineatus*
Distribution: Gulf of Tonkin

Genus *Pseudorhabdosynochus* Yamaguti, 1958
109. *P. brunei* Dang, Bristow, Schander & Berland, 2013**
Dang et al., 2013: 52
Host: Longtooth grouper *Epinephelus bruneus*
Distribution: Nha Trang bay

110. *P. cotoides* Bu, Leong, Wong & Foo, 1999
Hosts: Duskytail grouper *E. bleekeri*, malabar grouper *E. malabaricus*, Greasy grouper *E. tauvina*, warsaw grouper *Hyporthodus nigritus**
Vo et al., 2010: 26
Distributions: Gulf of Tonkin, Nha Trang bay

111. *P. cupatus* (Young, 1969) Kritsky & Beverley-Burton, 1986
Te, 1998: 7; Arthur & Bui, 2006: 48
Host: sixbar grouper *E. sexfasciatus*
Distribution: Gulf of Tonkin

112. *P. epinepheli* (Yamaguti, 1938)
Kritsky and Beverley-Burton, 1986
Te, 1998: 7; Arthur & Bui, 2006: 48; Vo et al., 2010: 27
Hosts: Duskytail grouper *E. bleekeri*, longtooth grouper *E. bruneus*, malabar grouper *E. malabaricus*, greasy grouper *E. tauvina*, warsaw grouper *H. nigritus**
Distributions: Gulf of Tonkin

113. *P. grouperi* (Bu, Leong, Wong & Foo, 1999) Wu, Li, Zhu & Xie, 2005
Syn. *Diplectanum grouperi* Bu, Leong, Wong, Woo & Foo, 1999
Vo et al., 2010: 24
Hosts: Duskytail grouper *E. bleekeri*, longtooth grouper *E. bruneus*, malabar grouper *E. malabaricus*, greasy grouper *E. tauvina*, warsaw grouper *H. nigritus**
Distributions: Gulf of Tonkin

114. *P. hargisi* (Oliver & Paperna, 1984) Santos, Buchmann & Gibson, 2000
Syn. *Diplectanum hargisi* Oliver and Paperna, 1984
Te, 1998: 8; Arthur & Bui, 2006: 48
Hosts: Longtooth grouper *E. bruneus*, sixbar grouper *E. sexfasciatus*, greasy grouper *E. tauvina*
Distribution: Gulf of Tonkin

115. *P. lantauensis* Beverley-Burton and Suriano, 1981
Vo et al., 2010: 28
Hosts: Duskytail grouper *E. bleekeri*, malabar grouper *E. malabaricus*, warsaw grouper *Hyporthodus nigritus*
Distributions: Gulf of Tonkin, Nha Trang bay
116. *P. nhatrangensis* Dang, Bristow, Schander & Berland, 2013**
   Dang et al., 2013: 46
   Hosts: Duskytail grouper *E. bleekeri*, Orange-spotted grouper *E. coioides*
   Distribution: Nha Trang bay
117. *P. serrani* (Yamaguti, 1953) Kritsky & Beverley-Burton, 1986
   Vo et al., 2010: 32
   Hosts: duskytail grouper *E. bleekeri*, malabar grouper *E. malabaricus*, greasy grouper *E. tauvina*, warsaw grouper *Hyporthodus nigritus*
   Distribution: Nha Trang bay
118. *P. summanae* (Young, 1969) Kritsky & Beverley-Burton, 1986
   Vo et al., 2010: 31
   Hosts: duskytail grouper *E. bleekeri*, warsaw grouper *Hyporthodus nigritus*
   Distribution: Nha Trang bay
119. *P. summanoides* Yang, Gibson & Zeng, 2005
   Vo et al., 2010: 30
   Hosts: Duskytail grouper *E. bleekeri*, malabar grouper *E. malabaricus*, warsaw grouper *Hyporthodus nigritus*
   Distribution: Nha Trang bay
120. *P. vagamipullum* (Young, 1969) Kritsky & Beverley-Burton, 1986
   Vo et al., 2010: 31
   Host: Longspine grouper *E. longispinis* (syn. *E. fario*)
   Distribution: Nha Trang bay
121. *P. vietnamensis* Dang, Bristow, Schander & Berland, 2013**
   Dang et al., 2013: 49
   Hosts: Duskytail grouper *E. bleekeri*, orange-spotted grouper *E. coioides*
   Distribution: Nha Trang bay
Genus *Telegamatrix* Ramalingum, 1955
122. *T. elegans* Bychowsky & Nagibina, 1976
   Bychowsky & Nagibina, 1976: 9
   Host: Pugnose ponyfish *Secutor insidiator* (syn. *Leiognathus insidiator*)
   Distribution: Gulf of Tonkin
123. *T. grandis* Bychowsky & Nagibina, 1976
   Bychowsky & Nagibina, 1976: 10
   Host: Pugnose ponyfish *S. insidiator*
   Distribution: Gulf of Tonkin
124. *T. ramalingami* Bychowsky & Nagibina, 1976
   Bychowsky & Nagibina, 1976: 12
   Host: Pugnose ponyfish *S. insidiator*
   Distribution: Gulf of Tonkin
Order GYRODACTYLIDEA Bychowsky, 1937
Family Tetraonchoididae Bychowsky, 1951
Genus *Paratetraonchoides* Bychowsky, Gussev & Nagibina, 1965
125. *P. inermis* Bychowsky, Gussev & Nagibina, 1965
   Bychowsky et al., 1965: 144
   Host: Longnosed stargazer *Ichthyscopus lebeck*
   Distribution: Gulf of Tonkin
Genus *Pavlovscoliodes* Bychowsky, Gussev & Nagibina, 1965
126. *P. ichthyoscopi* Bychowsky, Gussev & Nagibina, 1965
   Bychowsky et al., 1965: 146
   Host: Longnosed stargazer *Ichthyscopus lebeck*
   Distribution: Gulf of Tonkin
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127. *P. litoralis* Bykhovsky, Gussev and Nagibina, 1965
   Bychowsky et al., 1965: 148
   Host: Snakefish *Trachinocephalus myops*
   Distribution: Gulf of Tonkin
   Genus *Pseudotetraonchoides* Bychowsky, Gussev & Nagibina, 1965

128. *P. bleekeriae* Bychowsky, Gussev & Nagibina, 1965
   Bychowsky et al., 1965: 152
   Host: sand lance *Bleekeria viridianguilla*
   Distribution: Gulf of Tonkin

Order **MONOCOTYLIDEA** Lebedev, 1988

Family **Monocotylidae** Taschenberg, 1879

Genus *Monocotyle* Taschenberg, 1878
129. *M. ancylostomae* Timofeeva, 1984
   Timofeeva, 1984: 299
   Host: Bowmouth guitarfish *Rhina ancylostoma*
   Distribution: Gulf of Tonkin

130. *M. undosocirrus* Timofeeva, 1984
   Timofeeva, 1984: 297
   Host: Twin-spot butterfly ray *Gymnura bimaculata*
   Distribution: Gulf of Tonkin

Genus *Heterocotyle* Scott, 1904
131. *H. armata* Timofeeva, 1983
   Timofeeva, 1983: 39
   Host: Honeycomb stingray *Dasyatis uarnak*
   Distribution: Gulf of Tonkin

132. *H. confusa* Timofeeva, 1983
   Timofeeva, 1983: 37
   Host: Honeycomb stingray *D. uarnak*
   Distribution: Gulf of Tonkin

Genus *Neoheterocotyle* Hargis, 1955
133. *N. bychowskyi* (Timofeeva, 1981)
   Chisholm, 1994
   Timofeeva, 1981: 400
   Host: Giant guitarfish *Rhynchobatus djiddensis* (syn. *Rhinobatus djiddensis*)
   Distribution: Gulf of Tonkin

134. *N. nagibinae* (Timofeeva, 1981)
   Chisholm, 1994
   Timofeeva, 1981: 401
   Host: Giant guitarfish *R. djiddensis*
   Distribution: Gulf of Tonkin

135. *N. rhinobatis* (Pillai & Pillai, 1976)
   Chisholm & Whittington, 1997
   Timofeeva, 1981: 402
   Host: Giant guitarfish *R. djiddensis*
   Distribution: Gulf of Tonkin

Genus *Dasybatotrema* Price, 1936
136. *D. spinosum* Timofeeva, 1983
   Timofeeva, 1983: 42
   Host: Round ribbontail ray *Taeniura meyeni* (Sny. *Taeniurops meyeni*)
   Distribution: Gulf of Tonkin

Genus *Timofeevia* Chisholm, Wheeler & Beverley-Burton, 1995
137. *T. rajae* (Timofeeva, 1983)
   Chisholm, Wheeler & Beverley-Burton, 1995
   Syn. *Dasybatotrema rajae* Timofeeva, 1983
   Timofeeva, 1983: 44
   Host: ray *Dasyatis sp.*
   Distribution: Gulf of Tonkin

SUBCLASS **OLIGONCHOINEA** BYCHOWSKY, 1937

Order **MAZOCRAEIDEA** Bychowsky, 1937

Family **Allodiscocotylidae** Tripathi, 1959

Genus *Allodiscocotyla* Yamaguti, 1953
138. *A. chorinemi* Yamaguti, 1953
   Lebedev, 1970a: 193; Lebedev et al., 1970: 193; Parukhin, 1976: 98
Hosts: Doublespotted queenfish Scomberoides lysan; scad Caranx sp.; scad Decapterus sp.
Distribution: Gulf of Tonkin
139. A. diacanthi Unnithan, 1962
Lebedev et al., 1970a: 193
Host: Scad Decapterus sp.
Distribution: Gulf of Tonkin
Genus Camopia Lebedev, 1970
140. C. rachycentri Lebedev, 1970
Lebedev, 1970b: 666, 1986: 151
Host: Cobia Rachycentron canadum
Distribution: Gulf of Tonkin
Genus Metacamopia (Unnithan, 1962) Lebedev, 1972
141. M. indica (Unnithan, 1962) Lebedev, 1972
Host: Doublespotted queenfish Scomberoides lysan
Lebedev, 1972b: 128; Lebedev, 1986: 153
Distribution: Gulf of Tonkin
142. M. chormemi (Yamaguti, 1953) Lebedev, 1984
Lebedev et al., 1970: 194; Lebedev, 1986: 153
Hosts: Doublespotted queenfish S. lysan; bigeye scad Selar crumenopthalmus
Distribution: Gulf of Tonkin
Family Axinidae Monticelli, 1903
Genus Loxuroides Price, 1962
143. L. pricei Nguyen, Nguyen, Bui & Ha, 2016
Nguyen et al., 2016: 391
Host: Pharao flyingfish Cypselurus naresii
Distributions: Gulf of Tonkin; South Central coast
Genus Unnithanaxine Price, 1962
144. U. naresii Nguyen, Nguyen, Bui & Ha, 2016
Nguyen et al., 2016: 388
Host: Pharao flyingfish Cypselurus naresii
Distributions: Gulf of Tonkin; South Central coast

Family Bychowskicotylidae Lebedev, 1969
Genus Bychowskicotyle Lebedev, 1969
145. B. plectorhynchi Lebedev, 1969
Lebedev, 1986: 99
Host: Crescent sweetlips Plectorhynchus cinctus
Distribution: Gulf of Tonkin
Genus Tonkinopsis Lebedev, 1972
146. T. transfretanus Lebedev, 1972
Lebedev, 1972a: 151
Host: Crescent sweetlips P. cinctus
Distribution: Gulf of Tonkin
Family Diclidophoridae Cerfontaine, 1895
Genus Choricotyle van Beneden & Hesse, 1863
147. C. pellonae Kritsky & Bilgee, 1973
Mamaev, 1975: 108
Host: Elongate ilisha Ilisha elongata
Distribution: Gulf of Tonkin
148. C. polynemi Mamaev, 1972
Mamaev, 1972a: 158
Hosts: Blackspot threadfin Polynemus sextarius; fourfinger threadfin Eleutheronema tetractylum
Distribution: Gulf of Tonkin
Genus Helciferus Mamaev, 1972
149. H. tenuis Mamaev, 1972
Mamaev, 1973: 1236
Host: Osbeck's grenadier anchovy Coilia mystus
Distribution: Gulf of Tonkin
Genus Heterobothrium Cerfontaine, 1895
150. H. tonkinensis Bychowsky & Nagibina, 1976
Bychowsky et al., 1976: 31
Hosts: Silver-cheeked toadfish *Lagocephalus sceleratus*, *Takifugu* sp.
Distribution: Gulf of Tonkin
Genus *Osphyobothrus* Yamaguti, 1958
151. *O. bychowskyi* Khoche & Chauhan, 1969
Mamaev & Parukhin, 1970: 305; Parukhin, 1976: 112
Host: Greater lizardfish *Saurida tumbil* Distributions: Gulf of Tonkin; South Central coast
152. *O. multivitellatus* Mamaev & Parukhin, 1970
Mamaev & Parukhin, 1970: 308
Host: Greater lizardfish *S. tumbil*
Distribution: vịnh Thái Lan
Genus *Papillochoricotyle* Mamaev, 1975
153. *P. ilishae* Mamaev, 1975
Mamaev, 1975: 110
Hosts: Elongate ilisha *Ilisha elongata*, *Ilisha* sp.
Distribution: Gulf of Tonkin
Genus *Upenicola* Unnithan, 1966
154. *U. capheni* Mamaev, 1972
Mamaev, 1972b: 166
Hosts: Sulphur goatfish *Upeneus sulphureus*; goatfish *Parupeneus* sp.
Distribution: Gulf of Tonkin
155. *U. digitata* Mamaev, 1972
Mamaev, 1972b: 164
Hosts: Sulphur goatfish *U. sulphureus*; goatfish *Parupeneus* sp.
Distribution: Gulf of Tonkin
156. *U. upeneoides* Unnithan, 1966
Mamaev, 1972b: 165
Host: Sulphur goatfish *U. sulphureus*; goatfish *Parupeneus* sp.
Distribution: Gulf of Tonkin
Genus *Urocotyle* Unnithan, 1966
157. *U. anellus* Mamaev, 1972
Mamaev, 1972b: 167
Host: Sin croaker *Johnius dussumieri*
Distribution: Gulf of Tonkin

Family *Gastrocotylidae* Price, 1943
Genus *Allopseudaxine* Yamaguti, 1943
158. *A. macrova* (Unnithan, 1957) Yamaguti, 1963
Lebedev, 1968a: 49
Host: scad *Caranx* sp.
Distribution: Gulf of Tonkin
Genus *Churavera* Unnithan, 1968
159. *C. triangula* (Mamaev, 1967) Lebedev, 1986
Lebedev, 1986: 65
Host: Frigate tuna *Auxis thazard*
Distribution: Gulf of Tonkin
Genus *Gastrocotyle* Beneden & Hesse, 1863
160. *G. indica* Subhapradha, 1951
Lebedev, 1986: 52
Host: Shrimp scad *Alepes djedaba* (syn. *Caranx kalla*)
Distribution: Gulf of Tonkin
161. *G. kalla* Unnithan, 1968
Lebedev, 1986: 52
Hosts: Shrimp scad *A. djedaba*, Blackfin scad *Decapterus* sp.
Distribution: Gulf of Tonkin
162. *G. trachuri* Van Beneden & Hesse, 1863
Lebedev, 1968a: 49
Hosts: Bigeye scad *Selar crumenophthalmus*; scad *Decapterus* sp.
Distribution: Gulf of Tonkin
Genus *Pseudaxine* Parona & Perugia, 1890
163. *P. bivaginalis* Dillon & Hargis, 1965
Lebedev, 1986: 54
Host: Yellowstripe scad *Selaroides leptolepis*
Distribution: Gulf of Tonkin

164. *P. kurra* Unnithan, 1968
Lebedev, 1986: 54

Hosts: Torpedo scad *Megalaspis cordyla*; yellowtail scad *Atule mate*

Distribution: Gulf of Tonkin

165. *P. trachuri* Parona & Perugia, 1889
Lebedev, 1986: 53

Hosts: Malabar trevally *Caranoides malabaricus* (syn. *Caranx malabaricus*); scad *Caranx sp.*; scad *Decapterus* sp.

Distribution: Gulf of Tonkin
Genera *Pseudaxinoide* Lebedev, 1968

166. *P. bychowski* Lebedev, 1977
Lebedev, 1986: 56

Host: Shrimp scad *Alepes djedaba*

Distribution: Gulf of Tonkin

167. *P. caballeroi* Lebedev, 1977
Lebedev, 1986: 56

Host: Shrimp scad *A. djedaba*

Distribution: Gulf of Tonkin

168. *P. decapteri* (Yamaguti, 1968)
Lebedev, 1977
Lebedev, 1986: 57

Host: Japanese scad *Decapterus maruadsi*

Distribution: Gulf of Tonkin

169. *P. vietnamensis* Lebedev, Parukhin & Roitman, 1970
Lebedev, 1986: 56; Lebedev et al., 1970: 198; Parukhin, 1976: 92

Hosts: Bigeye scad *Selar crumenophthalmus*; yellowstripe scad *Selaroides leptolepis*; greater amberjack *Seriola dumerili*; trevally *Caranx sp.*; scad *Decapterus* sp.

Distribution: Gulf of Tonkin
Genera *Sibitrema* Yamaguti, 1966

170. *S. poonui* Yamaguti, 1966
Mamaev, 1967: 994; Lebedev, 1986: 60

Hosts: Kawakawa *Euthynnus affinis*; frigate tuna *Auxis thazard*; Atlantic bluefin tuna *Thunnus thynnus*

Distribution: Gulf of Tonkin

Family *Gotocotylidae* Yamaguti, 1963

Genus *Cathucotyle* Lebedev, 1968

171. *C. cathuaui* Lebedev, 1968
Lebedev, 1968a: 46, 1970a, 1986: 143

Hosts: Narrow-barred Spanish mackerel *Scomberomorus commerson*, Indo-Pacific king mackerel *S. guttatus*

Distribution: Gulf of Tonkin
Genera *Cathucotyle* Ishii, 1936

172. *G. acanthura* (Parona & Perugia, 1896) Meserve, 1938
Syn. *G. secunda* (Tripathi, 1954)
Lebedev, 1970a: 201

Host: Narrow-barred Spanish mackerel *S. commerson*

Distribution: Gulf of Tonkin

173. *G. bivaginalis* (Ramalingam, 1961) Rohde, 1976
Syn. *G. laticauda* Lebedev, 1970
Lebedev, 1970a: 202; Lebedev, 1986: 141

Host: Narrow-barred Spanish mackerel *S. commerson*

Distribution: Gulf of Tonkin

Family *Heteraxinidae* Unnithan, 1957

Genus *Bicotyle* Tripathi, 1956

174. *B. perpolita* Lebedev, 1968
Lebedev, 1968b: 48

Hosts: Silver pomfret *Pampus argenteus*; black pomfret *Parastromateus niger*

Distribution: Gulf of Tonkin

Genus *Heteraxine* Yamaguti, 1938

175. *H. heterocerca* (Goto, 1894)
Yamaguti, 1938
Lebedev, 1968a: 82, 1970a: 206
Host: Bigeye scad *Selar crumenophthalmus*
Distributions: Gulf of Tonkin, South Central coast

Genus Kannaphallus Unnithan, 1957
176. *K. virilis* Unnithan, 1957
Lebedev, et al. 1970a: 198; Mamaev, 1990: 226
Host: Indian threadfish *Alectis indica*
Distribution: Gulf of Tonkin

Genus Lethrinaxine Mamaev, 1970
177. *L. parva* Mamaev, 1970
Mamaev, 1970: 146
Host: Grey large-eye bream
Distribution: Gulf of Tonkin

Family Heteromicrocotylidae Unnithan, 1961

Genus Heteromicrocotyla Yamaguti, 1953
179. *H. carangis* Yamaguti, 1953
Lebedev, 1970a: 197; Mamaev, 1988a: 37
Host: Black pomfret *Parastromateus niger*
Distribution: Gulf of Tonkin
180. *H. paruchini* Mamaev, 1968
Mamaev, 1988a: 42
Hosts: Malabar trevally *C. malabaricus*, Carangoides sp.
Distribution: Gulf of Tonkin
181. *H. polyorchis* Unnithan, 1961
Lebedev, 1970a: 197
Hosts: Shadow trevally *C. dinema*, Bigeye trevally *C. sexfasciatus*
Distribution: Gulf of Tonkin
182. *H. vaginispina* Unnithan, 1961
Lebedev, 1970a: 197; Mamaev, 1988a: 43
Host: Malabar trevally *C. malabaricus*
Distribution: Gulf of Tonkin

Family Hexostomatidae Price, 1936

Genus Hexostoma Rafinesque, 1815
183. *H. thyyni* (Delaroche, 1811)
Syn. *H. auxisi* Palombi, 1943
Mamaev, 1968: 18
Host: Frigate tuna *Auxis thazard*
Distribution: Gulf of Tonkin
Genus Neohexostoma Price, 1961
184. *N. euthynni* (Meserve, 1938) Price, 1961
Mamaev, 1968: 21
Hosts: Frigate tuna *Auxis thazard*, kawakawa *Euthynnus affinis*
Distribution: Gulf of Tonkin

Family Mazocraeidae Price, 1936

Genus Engraulicola George, 1960
185. *E. thrissocles* (Tripathi, 1959)
Lebedev, 1971
Syn. *Paramazocraes thrissocles* Tripathi, 1959
Mamaev, 1975: 111
Host: Anchovy *Thrisocles* sp.
Distribution: Gulf of Tonkin
Genus Heteromazocraes Mamaev, 1981
186. *H. coiliae* Mamaev, 1981
Mamaev, 1981: 174
Host: Gray's grenadier anchovy *Coilia grayii*
Distribution: Gulf of Tonkin
187. *H. dodecacantha* Mamaev, 1981
Mamaev, 1981: 176
Host: Anchovy *Thrisocles* sp.
Distribution: Gulf of Tonkin
188. *H. vicinus* (Mamaev, 1975) Mamaev, 1981
Mamaev, 1975: 112, 1981: 177
Hosts: Anchovy Thrissocles sp.;
hamilton's thryssa T. hamiltonii
Distribution: Gulf of Tonkin
Genus Leptomazocraes Mamaev, 1975
189. L. orientalis (Chauhan, 1950)
Mamaev, 1975
Mamaev, 1975: 103
Host: Slender rainbow sardine Dussumieria elopsoïdes
Distribution: Gulf of Tonkin
190. L. trispina (Unnithan, 1964)
Mamaev, 1981
Mamaev, 1981: 179
Host: Slender rainbow sardine D. elopsoïdes
Distribution: Gulf of Tonkin
Genus Mazocraeoides Price, 1936
191. M. dussumieri Mamaev, 1975
Mamaev, 1975: 104
Host: Slender rainbow sardine D. elopsoïdes
Distribution: Gulf of Tonkin
Genus Neomazocraes Price, 1943
192. N. dorosomatis (Yamaguti, 1938)
Price, 1943
Nguyen, 2012: 40
Host: Chinese gizzard shad Clupanodon thrissa
Distribution: Ha Long bay
Genus Pseudoanthocotyle Bychowsky & Nagibina, 1954
194. P. pavlovskyi Bychowsky & Nagibina, 1954
Bychowsky & Nagibina, 1954: 32
Host: Indian mackerel Rastrelliger kanagurta
Distribution: Gulf of Tonkin
Genus Pseudomazocraes Price, 1961
195. P. longicauda (Mamaev, 1975)
Mamaev, 1984
Mamaev, 1975: 113
Host: Slender rainbow sardine Dussumieria elopsoïdes
Distribution: Gulf of Tonkin

Family Microcotylidae Taschenberg, 1879
Genus Caballeraxine Lebedev, 1972
196. C. chainanica (Lebedev, Parukhin & Roitman, 1970) Lebedev, 1972
Lebedev, et al. 1970: 198; Mamaev & Kurochin, 1976: 18
Host: Malabar trevally Caranx malabaricus
Distribution: Gulf of Tonkin
Genus Diplostamenides Unnithan, 1971
197. D. sciaenae (Goto, 1894) Mamaev, 1986
Syn. Microcotyle hemiatriospinalis Lebedev, Parukhin and Roytman, 1970
Lebedev, 1970a: 196; Lebedev, et al. 1970: 171; Parukhin, 1976: 122; Mamaev, 1986: 201
Host: Amberjacks Seriola sp.
Distribution: Gulf of Tonkin
Genus Intracotyle Mamaev, 1970
198. I. orientalis Mamaev, 1970
Mamaev, 1970: 184
Host: Saddle grunt Pomadasys maculatus
Distribution: Gulf of Tonkin
Genus Lutianicola Lebedev, 1970
199. L. haifonensis Lebedev, 1970
Lebedev, 1970a: 194
Host: Emperor red snapper Lutjanus sebae, russell's snapper L. russellii
Distribution: Gulf of Tonkin
Genus **Microcotyle** Van Beneden & Hesse, 1863

200. *M. arrips* Sandars, 1945
Bychowsky & Nagibina, 1975b: 215

Hosts: Whitecheek monocle bream *Scolopsis vosmeri*, lattice monocle bream *S. taeniopterus*; yellowtail amberjack *Seriola lalandi* (syn. *S. aureovittata*)

Distribution: Gulf of Tonkin

201. *M. fistulariae* Mamaev, 1989

Mamaev, 1989: 143

Host: Red cornetfish *Fistularia petimba*

Distribution: Gulf of Tonkin

Genus **Monomacracanthus** Mamaev, 1976

202. *M. cadodai* Mamaev, 1976

Mamaev, 1976: 31

Hosts: Large yellow croaker *Larimichthys crocea* (syn. *Pseudosciaena crocea*); sin croaker *Johnius dussumieri*

Distribution: Gulf of Tonkin

Genus **Polylabris** Euzet & Cauwet, 1967

203. *P. gerres* (Sandars, 1944) Mamaev & Parukhin, 1976

Mamaev & Parukhin, 1976: 250

Hosts: Saddleback silver-biddy *Gerres lucidus*; whipfin silver-biddy *G. filamentosus*

Distribution: Gulf of Tonkin

204. *P. tubicirrus* (Paperna & Kohn, 1964) Mamaev & Parukhin, 1976

Mamaev & Parukhin, 1976: 247

Hosts: Toothpony *G. minita*; pugnose ponyfish *L. insidiator*

Distribution: Gulf of Tonkin

Genus **Polylabroides** Mamaev & Parukhin, 1976

205. *P. zini* Mamaev, 1987

Mamaev, 1988b: 196

Hosts: Goldsilk seabream *A. berda*, Yellowfin seabream *A. latus*

Distribution: Gulf of Tonkin

Genus **Polynemicola** Unnithan, 1971

206. *P. ambigua* Mamaev, 1977

Mamaev, 1977: 94

Hosts: Blackspot threadfin *Polynemus sextarius*, *Eleutheronema* sp.

Distribution: Gulf of Tonkin

207. *P. sciaenae* Mamaev, 1977

Mamaev, 1977: 96

Host: Sin croaker *Johnius dussumieri*

Distribution: Gulf of Tonkin

Genus **Tonkinaxine** Lebedev, Parukhin & Roytman, 1970

208. *T. homocerca* Lebedev, Parukhin and Roytman, 1970

Lebedev, 1970a: 197; Lebedev et al., 1970a: 175; Parukhin, 1976: 86

Hosts: Blackbanded trevally *Seriolina nigrofasciata*; greater amberjack *Seriola dumerili*, *Seriola* sp.

Distributions: Gulf of Tonkin, South Central coast

Family **Paramonaxinidae** Mamaev, 1990

Genus **Incisaxine** Mamaev, 1970

209. *I. dubia* Mamaev, 1970

Mamaev, 1970: 149

Host: Whipfin silver-biddy *Gerres filamentosus*

Distribution: Gulf of Tonkin

Family **Plectanocotylidae** Monticelli, 1903

Genus **Triglicola** Mamaev & Parukhin, 1972

210. *T. tonkinensis* Mamaev & Parukhin, 1972

Mamaev & Parukhin, 1972: 66; Parukhin, 1989: 121

Host: Gurnard *Lepidotrygla* sp.

Distribution: Gulf of Tonkin
Family Protomicrocotylidae Johnston & Tiegs, 1922
Genus Bilaterocotyloides Ramalingam, 1961
211. B. carangis Ramalingam, 1961
Lebedev et al., 1970: 194; Parukhin, 1989: 124
Host: Torpedo scad Megalaspis cordyla
Distribution: Gulf of Tonkin
212. B. madrasensis Radha, 1966
Lebedev, 1986: 115
Host: Torpedo scad M. cordyla
Distribution: Gulf of Tonkin
Genus Neomicrocotyle Ramalingam, 1960
213. N. indica Ramalingam, 1960
Bychowsky & Nagibina, 1975b: 216
Host: Bigeye trevally Caranx sexfasciatus
Distribution: Gulf of Tonkin
Genus Vallisiopsis Subhapradha, 1951
214. V. contorta Subhapradha, 1951
Lebedev, 1986: 118
Host: False trevally Lactarius lactarius
Distribution: Gulf of Tonkin
215. V. sphyraenae Yamaguti, 1968
Lebedev, 1986: 118
Host: Yellowtail barracuda Sphyrna flavicauda (syn. S. langsar)
Distribution: Gulf of Tonkin
Genus Youngiopsis Lebedev, 1972
216. Y. australis (Young, 1968) Lebedev, 1972
Lebedev, 1972b: 132
Host: Obtuse barracuda S. obtusata
Distribution: Gulf of Tonkin
Family Pseudodiclidophoridae Yamaguti, 1965
Genus Quillonella Lebedev & Parukhin, 1970
217. Q. ventrosa Lebedev & Parukhin, 1970
Lebedev & Parukhin, 1970: 458
Hosts: Cobia Rachycentron canadum; Japanese scad Decapterus maruadsi
Distributions: Gulf of Tonkin, South Central coast
Family Pterinotrematidae Caballero & Bravo-Hollis, 1955
Genus Pterinotrema Caballero, Bravo-Hollis & Grocott, 1954
218. P. mirabile Bychowsky & Nagibina, 1959
Bychowsky & Nagibina, 1959: 218
Host: Bonefish Albula vulpes
Distributions: Gulf of Tonkin, South Central coast
Family Thoracocotylidae Price, 1936
Genus Pricea Chauhan, 1945
219. P. multae Chauhan, 1945
Lebedev, 1970: 201
Hosts: Narrow-barred Spanish mackerel Scomberomorus commerson, Indo-Pacific king mackerel S. guttatus
Distributions: Gulf of Tonkin, South Central coast
Genus Pseudothoracocotyla Yamaguti, 1963
220. P. ovalis (Tripathi, 1956) Yamaguti, 1963
Lebedev, 1970: 204
Hosts: Narrow-barred Spanish mackerel Scomberomorus commerson, Indo-Pacific king mackerel S. guttatus
Distributions: Gulf of Tonkin, South Central coast
Notes: “*”: The distribution of the warsaw grouper Hyporthodus nigritus is mainly in the western of Atlantic Ocean, so all records of warsaw grouper Hyporthodus nigritus in the off Vietnam could be misidentified. The correct species, for instance, is generally considered to a tenspine grouper Epinephelus.
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exsul, which is distributed in Indo-Pacific region; “***”: Not accepted yet by WoRMS (2020).

DISCUSSION

In this paper, we updated the list of monogenea fauna from marine fishes of Vietnam. The list includes 220 species, this number is greater comparing with 135 species in the list of Arthur & Bui (2006). In addition, the modification of contemporary classifications of several taxa also was updated.

At higher taxonomic levels, i.e. subclass, there are two classification systems which are bilateral used at the present (Wheeler & Chisholm, 1995), including (1) the system was proposed by Llewellyn (1970) and revised by Beverley-Burton (1984) and (2) the system was proosed by Bychowsky (1937) and revised by Boeger & Kritsky (1993). The classification system of Llewellyn (1970) and Beverley-Burton (1984) is divided the class of Monogenea into two subclasses, Monopisthocotylea and Polyopisthocotylea, based on several morphological characters of fluke, e.g. the structure, shape and size of opisthohaptor and parasitic position on its hosts. This system is simple and is used by WoRMS (2020) for updating data. The system of Bychowsky (1937) and Boeger & Kritsky (1993) divides the class of Monogenea into two subclasses, Monopisthocotylea and Polyopisthocotylea, based on several morphological characters of fluke, e.g. the structure, shape and size of opisthohaptor and parasitic position on its hosts. This system is simple and is used by WoRMS (2020) for updating data.

At the level of genus, Allopseudaxine was moved to Axinidae from Gastrocotylidae (Hayward & Rohde, 1999a), Tonkinaxine was moved to Microcotylidae from Heteraxinidae (Mamaev, 1986). Mamaev (1990) transferred some genera from Microcotylidae to other families, e.g. Incisaxine was moved to Paramonaxinidae, Kannaphallus and Lethrinaxine were moved to Heteraxinidae.

At the level of species, Arthur & Bui (2006) arranged two species, Vallisia chorinemi and Triglicola tonkinensis, in Anthocotylidae, however, they are belonging to Allodiscocotylidae (Lebedev, 1984) and Plectanocotylidae (Parukhin 1989), separately. In addition, Lebedev (1984) also transferred V. chorinemi to Metacamopia. Bychowsky & Nagibina (1970) moved Ancyrocephalus bilobatus and A. spinicirrus to Haliotrema; similarly, A. scapulasser was transferred to Protohyropectus (Gussev, 1973), and Diplectanum hargisi was moved to Pseudorhabdosynochus (Santos et al., 2000).

Moreover, the name of four species, Dawesia incise, Microcotyle hemiarispinalis, Gotocotyla latiatauda và G. secunda were changed in succession to Pseudothoracocotyla ovalis, Diplostamenides sciaenae, Gotocotyla bivinvalis and G. Acanthura (Hayward & Rohde, 1999b; Mamaev, 1986; Rohde, 1976).

Three species, Pseudorhabdosynochus bruneus, P. nhatrangensis and P. vietnamensis which were found from grouper by Dang et al. (2013), are unaccepted because the publication is not compliant with Article 8.5 (2012) of the International Commission on Zoological Nomenclature WoRMS (2020). In this paper, however, we listed all three mentioned species because of theirs exist.

In addition, there are 23 monogenean species, which were identified at genus level, including: 17 species of Ligophorus (Garasev et al., 2011a, b; Dmitrieva et al., 2013); 1 species of Diplectanum (Mamaev, 1970); 1 species of Gastrocotyle (Lebedev, 1970a); 1 species of Microcotyle (Lebedev et al., 1970); 1 species of Pseudaxine (Parukhin, 1976); 1 species of Benedenia (Te, 1998); 1 species of Haliotrema (Vo et al., 2010). All of them did
not count in the list above but the future studies should clarify the taxonomic position of these species.

Relating to the host-parasite relationships, the great majority of monogeneans (70.9%, 156/220 species) use just only one host species, it shows the specialization of monogeneans to choose theirs host. Other monogenea species were found on two or even seven host species, e.g. Halotrema epinepheli has been found on the gills of 7 marine fish species. About fish hosts, some species are only infected by only one monogenean species while other species are infected by many congeneric monogenean species, e.g. Spotted scat Scatophagus argus, or by monogeneans of different genera, e.g. groupers Epinephelus spp., snapper Lujanus spp.

In conclusion, the monogenean fauna from marine fish of Vietnam is quite diverse, with 220 recorded species. However, almost period studies have only forcessed to discovery the biodiversity of these flukes. There are currently no studies on genetic, biological, ecological characters of monogeneans in the off Vietnam. In addition, the pathogens, which caused by monogeneans, also need to further study for reducing the damage to aquaculture.

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