Cymothoid Isopods (Crustacea: Isopoda) collected by Dr. Y. Kano in Toyama Bay of the Sea of Japan

Taketo Yamauchi
Toyama Institute of Health
17-1 Nakataikoyama, Imizu, Toyama, 939-0363, Japan

Noboru Nunomura
Toyama Science Museum
1-8-31 Nishinakano-machi, Toyama 939-8084, Japan

加野泰男博士採集の富山湾産ウオノエ科魚類寄生虫（甲殻綱：等脚目）

加野泰男博士が1974-2000年に富山湾で採集したウオノエ科魚類寄生虫標本45個体を調査した結果、以下の5属4種3未同定種を確認した：ウオノコバン属（新称）の未同定種 Nerosila sp.（宿主：マハゼ Acanthogobius flavimanus）、ウオノギンカ属（新称）の未同定種 Anilocra sp.（宿主：コノシロ Konasirus punctatus）、ソコウオノエ Ceratothoa oxyrhynchaena（宿主：アカムツ Doederleintia berycoides）、タイノエ Ceratothoa verrucosa（宿主：マダイ Pagrus major）、Mothocyasp.（宿主：サヨリ Hyperhamphus sajori）、エラヌシ属の未同定種 Mothocya sp.（宿主：メジナ Girella punctata, チャガラ Pierogobius zonoleucus）、Elthusa raynaudii。タイノエの学名は新経である。ソコウオノエは水深30-300mで採集された。本種は全長12-26cmのアカムツから採集され、アカムツに普通にみられる寄生虫であると考えられた。ウオノギンカ属の種と Elthusa raynaudii は日本海で初めて記録された。コノシロ（ニシン科）はウオノギンカ属の、そしてチャガラ（ハゼ科）はエラヌシ属の新宿主記録となる。

キーワード：ウオノエ科, 魚類寄生虫, 新経, 新分布記録, 新宿主記録, 垂直分布

Key words: Cymothoidae, fish parasite, new combination, new distributional record, new host record, vertical distribution

Cymothoid isopods are ectoparasites of marine, fresh, and brackish water fishes. In Japan, about 45 species of cymothoid isopods are known (Saito et al., 2000), but the study on cymothoid isopods in the Sea of Japan is much ignored and only a few study have been carried out (e.g. Nunomura, 1981, 1985). This paper deals with a collection of cymothoid isopods collected by Dr. Y. Kano in Toyama Bay of the Sea of Japan, between the years 1974 and 2000.

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Yamauchi and Nunomura

Materials and Methods

Samples were preserved in 70% ethanol or 10% neutralized Formalin/sea water solution. The common and scientific names of fishes follow those recommended by Froese and Pauly (2009). The material examined in this study is deposited in the Toyama Science Museum, Toyama (TOYA).

Results and Discussion

The collection includes a total of 45 specimens representing four species and three unidentified species stated below.

Family Cymothoidae

*Nerocila* sp. (Fig. 1)

Material examined. 1 male still attached to the host (7.0 mm), Uozu South Port, Uozu, 8 Oct. 1995, on pectoral fin of *Acanthogobius flavimanus* (Temminck and Schlegel, 1845), TOYA-Cr 20372; 1 male (8.5 mm), Uozu South Port, Uozu, 31 Oct. 2000, on the body surface of *A. flavimanus*, TOYA-Cr 20373.

*Anilocra* sp. (Fig. 2)

Material examined. 1 male (14.0 mm), Uozu Port, Uozu, 26 Jan. 1992, ex *Konosirus punctatus* (Temminck and Schlegel, 1846) (11 cm TL), TOYA-Cr 20371.

Remarks. The present specimen represents the first record for the genus *Anilocra* from the Sea of Japan. In the present study, the Konoshiro gizzard shad *Konosirus punctatus* (Clupeidae) is newly recorded as a host of *Anilocra* species.

*Ceratothoa oxyrrhynchaena* Koetbel, 1878

(Figs. 3-6)

Material examined. 1 male still attached to the host, off Iwase, Toyama, trawl net, 200 m depth, 13 Feb. 1997, in mouth of *D. berycoides*, TOYA-Cr 20350; 1 male (14.0 mm), 2 ovig. females (32.0, 32.0 mm), off Sanga, Uozu, 30 Sep. 1997, in mouths of *D. berycoides*, (3 exs., 16-20 cm TL), TOYA-Cr 20351~20355; 1 male (12.0 mm), 1 non-ovig. female (22.0 mm), off Aojima, Uozu, tangle net, 110 m depth, 20 Oct. 1997, in mouth of *D. berycoides* (16.5 cm TL), TOYA-Cr 20354~20355; 1 female still attached to the host, off Aojima, Uozu, tangle net, 60 m depth, 1 Jun. 1998, in mouth of *D. berycoides* (12 cm TL), TOYA-Cr 20356; 1 female still attached to the host, off Aojima, Uozu, tangle net, 30-40 m depth, 24 Jun. 1998, in mouth of *D. berycoides* (14.5 cm TL), TOYA-Cr 20357, 1 non-ovig. female (30.0 mm), off Aojima, Uozu, tangle net, 2 Jul. 1998, in mouth of *D. berycoides* (25 cm TL), TOYA-Cr 20358; 1 male (13.0 mm), 1 ovig. female (34.0 mm), off Uozu Port, Uozu, tangle net, 180 m depth, 1 Aug. 1998, in mouth of *D. berycoides* (26 cm TL), TOYA-Cr 20359~20360; 1 male (9.0 mm), 1 female still attached to the host, off Aojima, Uozu, tangle net, 60-70 m depth, 26 May 2000, in mouth of *D. berycoides* (14.2 cm TL), TOYA-Cr 20361~20362; 1 male (17.0 mm), 1 ovig. female (37.0 mm), off Aojima, Uozu, tangle net, 50-60 m depth, 26 Oct. 2000, in mouth of *D. berycoides* (22 cm TL), TOYA-Cr 20363~20364.

Remarks. In the Sea of Japan, *C. oxyrrhynchaena* was recorded only off Uchiura, Ishikawa Prefecture (Tatsu, 2002). Hence, the present study is the second and easternmost records of the species from the Sea of Japan. *Ceratothoa*
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_oxyrhynchaena_ has been recorded from 110-151 m depth in the Pacific coast of Honshu, Japan (Thielemann, 1910; Yamauchi, 2009). In the present study, this species was recorded from 30-300 m depth in Toyama Bay of the Sea of Japan.

The present study revealed that _C. oxyrhynchaena_ infected _D. berycoides_ of 12-26 cm TL. Judging from the materials examined, _C. oxyrhynchaena_ is probably a common parasite of the Rosy seabass _D. berycoides_, expensive edible fish in Japan. As stated by Yamauchi (2009), further study on the cymothoid infection of _D. berycoides_ should be made in Japan.

_Ceratothoa verrucosa_ (Schioedte and Meinert, 1883) new combination

(Figs. 7-8)

Material examined. 1 male (14.0 mm), 1 ovig. female (23.0 mm), off Sanga, Uozu, stationary net, 23 Oct. 1992, _ex Pagrus major_ (Temminck and Schlegel, 1843) (19 cm TL), TOYA-Cr 20365~20366.

Remarks. Bruce and Bowman (1989) treated _Rhexanella_ Stebbing, 1911 as a junior synonym of _Ceratothoa_ Dana, 1852 based on the diagnosis described by Schioedte and Meinert (1883). Therefore, we move _Rhexanella verrucosa_ (Schioedte and Meinert, 1883) to _Ceratothoa_.

_Mothocya parvosfis_ Bruce, 1986

(Figs. 9-11)

Material examined. 2 females still attached to the hosts, off the mouth of Hayatsuki River, Uozu-Namerikawa, stationary net, 21 Apr. 1976, in gill chamber of _Hyporhamphus sajori_ (Temminck and Schlegel, 1846), TOYA-Cr 20367~20368; 1 male (8.0 mm), 1 non-ovig. female (13.0 mm), fish market of Uozu Port, Uozu, 22 Apr. 1976, in gill chamber of _H. sajori_, TOYA-Cr 20369~20370; 1 male still attached to the hosts, the mouth of Kado River, Uozu, 4 Aug. 1996, in gill chamber of _H. sajori_ (7.9 cm TL), TOYA-Cr 20573.

_Mothocya sp._

(Fig. 12)

Material examined. 4 males (7.5, 6.5, 6.0, 5.0 mm), Sanga, Uozu, 12 Jul. 1979, on the body surface of _Girella punctata_ Gray, 1835 (2 exs., 3.6, 3.1 cm TL), TOYA-Cr 20574~20577; 1 male (7.0 mm), Uozu South Port, Uozu, 27 Aug. 1992, _ex head of Pterogobius zonoleucus_ Jordan and Snyder, 1901 (34 mm TL), TOYA-Cr 20378.

Remarks. In the present study, _Pterogobius zonoleucus_ (Gobiidae) is newly recorded as a host of _Mothocya_ species.

_Elthusa raynaudii_ (Milne-Edwards, 1840)

(Fig. 13)

Material examined. 1 non-ovig. female (23.0 mm), off Hayatsuki River, Uozu, 100 m depth, 12 Jun. 1974, host unknown, tangle net, TOYA-Cr 19970.

Remarks. The present specimen represents the second record for the species from Japan following two specimens recorded as _Livoneca epimerias_ Richardson, 1909 collected from Hakodate, Hokkaido (Richardson, 1909). The present specimen is the first record of _E. raynaudii_ from the Sea of Japan.

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Fig. 1. *Nerocila* sp., male (TOYA-Cr 20372) on pectoral fin of *Acanthogobius flavidus* (Temminck and Schlegel)

Fig. 2. *Anilocra* sp., male (TOYA-Cr 20371)

Fig. 3. *Ceratothoa oxyrhynchaena* Koelbel, female (TOYA-Cr 20346)

Fig. 4. *Ceratothoa oxyrhynchaena* Koelbel, male (TOYA-Cr 20347)

Figs. 5-6. *Ceratothoa oxyrhynchaena* Koelbel, female (TOYA-Cr 20350) in mouth of *Doederleinia berycoides* (Hilgendorf)

Fig. 7. *Ceratothoa verrucosa* (Schioedte and Meinert), female (TOYA-Cr 20365)

Fig. 8. *Ceratothoa verrucosa* (Schioedte and Meinert), male (TOYA-Cr 20366)
Fig. 9. *Mothocya parvostis* Bruce, female (TOYA-Cr 20369)

Fig. 10. *Mothocya parvostis* Bruce, male (TOYA-Cr 20370)

Fig. 11. *Mothocya parvostis* Bruce, female (TOYA-Cr 20367) in gill chamber of *Hyporhamphus sajori* (Temminck and Schlegel)

Fig. 12. *Mothocya* sp., male (TOYA-Cr 20378)

Fig. 13. *Elthusa raynaudii* (Milne-Edwards), female (TOYA-Cr 19970)