ON THE EXAMINATION AGAINST THE PARASITES OF ANTARCTIC KRILL, *EUPHAUSIA SUPERBA*

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In order to obtaine more information on the nutritive value as human foods or animal feeding stuffs and to estimate any existence of the potential health hazards, samples prepared from frozen krill were examined against the parasites.

MATERIALS AND METHODS

Antarctic krill, *Euphausia superba* were collected by use of the plankton nets in Antarctic Ocean by a catcher boat of Taiyo-Gygyo K.K. The localities, number and size of Antarctic krill examined are shown in Table 1. The krill were immediately stored at −40°C on the boat. These frozen samples were brought in our laboratory. The krill were pressed between two glass plates, and were inspected by the binocular dissecting microscope (10x) against the parasites.

TABLE 1. SURVEY OF THE PARASITES IN ANTARCTIC KRILL, *EUPHAUSIA SUPERBA*

No.	Date	Locality	at Antarctic krill			
			Body length* (SD)**	Body weight* (SD)**	No. exam.	No. positive of parasites
W I-1	1975-12-1	59°34′S 49°54′E	59.1(47-64)(3.56)	1.21(0.80-1.40)(0.15)	2,823	0
W I-2	1975-12-15	62°47′S 64°39′E	50.7(41-60)(4.89)	0.82(0.40-1.30)(0.21)	9,823	0
W I-3	1976-1-2	62°22′S 83°45′E	45.3(35-57)(5.96)	0.50(0.30-0.95)(0.17)	11.576	0
W I-4	1976-1-15	65°14′S 59°15′E	47.5(35-58)(4.83)	0.68(0.35-1.10)(0.21)	9,754	0
W I-5	1976-2-1	65°35′S 55°38′E	46.5(35-55)(5.27)	0.50(0.15-1.08)(0.19)	11,406	0
W I-6	1976-2-13	65°30′S 56°02′E	46.7(34-60)(5.74)	0.60(0.20-1.20)(0.22)	10,406	0
Total					55,295	0

*: No. of examined specimens=50; mm. and gram.
**: SD=standard deviation

RESULTS AND DISCUSSION

As shown in Table 1, 55,295 specimens of *Euphausia superba* in total examined were negative for the parasites at all.

Although the larvae of many species of helminthic have been found in various marine invertebrates (Sarsa, 1885 ; Lebour, 1917 ; 1923 ; Jepps, 1937 ; Uspenskaja, 1960 ; Rees, 1961 ; Dollfus, 1964 ; Oshima *et al.*, 1969 ; Overstreet, 1970 ; Komaki, 1970 ; Vivares, 1971 ; Reimer *et al.*, 1971 ; Smith, 1971 ; Shimazu, 1971 ; 1972 ; 1975a, b ; Shimazu and Oshima, 1972 ; Ramadevi and Rao, 1974 ; Kagei, 1974 ;

Sluiters, 1973 ; 1974 ; Shiraki *et al.*, 1976), the parasites of the health hazards were the larvae of *Anisakis* spp. and *Terranova* sp. (Anisakinae: Nematoda), and the larvae of *Anisakis* spp. and *Terranova* sp. have been found in various invertebrates including the euphausiids (Uspenskaja, 1960: *Thysanoessa raschii;* Oshima *et al.*, 1969, Shimazu and Oshima, 1972: *Thysanoessa raschii, Thysanoessa longipes, Euphausia pacifica;* Smith, 1971: *Thysanoessa inermis, Thysanoessa longicaudata;* Kagei, 1974: *Euphausia pacifica;* Sluiters, 1973, 1974: *Thysanoessa raschii*), the amphipoda (Uspenskaja, 1960: *Caprella septentrionalis*), the branchurans (Decapoda) (Uspenskaja, 1960: *Hyas araneus*), arrow worms (Chaetognatha) (Reimer *et al.*, 1971) and Prawns (Shiraki *et al.*, 1976: *Pandalus borealis* and *P. kessleri*) (Banning, 1970: *Meganyctiphaens norvegica*). However, according to the results of many previous papers and this examination, Type-I larvae of *Anisakis* are recognized to be heavily infected in the northern euphausiids, but the infection rates are decreased gradually in the lower latitude (Kagei, 1974). It is interesting that this geographical distribution is by the quantity of infected final hosts, the heavily infection with *Anisakis* larvae in the northern fishes and inhabited quantity of euphausiids, and the examination of 35,319 *Euphausia superba* from the Antarctic ocean by Kagei (1974) was negative for the larvae of *Anisakis* and other parasites. In the present examination, *Euphausia superba* from various parts of the Antarctic ocean is also negative for the larvae of *Anisakis.* This is interesting to related to that the present of *Anisakis* spp. in marine mammals from the Atlantic Ocean was not occured as found at the report of Kagei and Kureha (1970).

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REFERENCES

Dollfus, R. Ph., 1964. Sur le cycle évolutif d'un cestode diphyllide. Identification de la larve chez *Carcinus maenas* (L., 1758), hôte intermédiaire. *Ann. Parasit.* 39 (3): 235–241.

Jepps, M. W., 1937. Note on Apstein's parasites and some very early larval Platyhelminthes. *Parasit.* 29 (4): 554–558.

Kagei, N. and K. Kureha, 1970. Studies on Anisakid Nematoda (Anisakinae). I. Survey of *Anisakis* sp. on marine mammals collected in the Antarctic Ocean. *Bull. Inst. Publ. Health.*, 19 (3): 193–196 (in Japanese).

Kagei, N., 1974. Studies on Anisakid Nematoda (Anisakinae). IV. Survey of *Anisakis* larvae in the marine Crustacea. *Bull. Inst. Publ. Health.*, 23 (2): 65–71 (in Japanese).

Komaki, Y., 1970. On the parasitic organisms in a krill, *Euphausia similis*, from Suruga Bay. *J. Oceanogr. Soc. Japan.*, 26 (5): 283–295.

Lebour, M. V., 1917. Some parasites of *Saggita bipunctata. J. Marine Biol. Ass. United Kingdom.*, 11: 201–206.

Lebour, M. V., 1923. Note on the life history of *Hemiurus communis* Odhner. *Parasit.*, 15 (3): 233–235.

Oshima, T., T. Shimazu, H. Koyama and H. Akahane, 1969. On the larvae of the genus *Anisakis* (Nema-

toda: Anisakinae) from the euphausiids. *Jap. J. Parasit.*, 18: 241–248 (in Japanese).

OVERSTREET, R. M., 1970. A syncoeliid (Hemiuroidea Faust, 1929) Metacercaria on a Copepod from the Atlantic equatorial current. *J. Parasit.*, 56 (4): 834–836.

RAMADEVI, P. and K. H. RAO, 1974. The larva of *Echinobothrium reesae* Ramadevi, 1969 (Cestoda: Diphyllidea) from the body cavity of a pasiphaeid crustacean *Leptochela aculeocaudata* Paulson, 1875. *J. Helminth.* 48 (2): 129–131.

REES, G., 1961. *Echinobothrium acanthinophyllum* n. sp. from the spiral valve of *Raja montagui* Fowler. *Parasit.* 51. 407–414.

REIMER, L. W., CH. BERGER, B. HEUER, H. Lainka, I. ROSENTHAL and I. SCHARNWEBWE, 1971. On the distribution of larvae of helminths in plankton of the North Sea. *Parasit.*, 5: 542–550. (in Russian).

SARS, G. O., 1885. Report on the Schizopoda collected by H.M.S. Challenger during the years 1873–87. *Rep. Scient. Results Voyage H.M.S. Challenger*, 1873–76, 13: 1–228.

SHIMAZU, T., 1971. Description of the progenetic Metacercaria of *Pseudopecoelus japonicus* (Allocreadiidae: Trematoda) from *Euphausia similis* (Euphausiacea: Crustacea) of Suruga Bay. *Jap. J. Parasit.*, 20 (2): 83–86.

SHIMAZU, T., 1972. On the parasitic organisms in a krill, *Euphausia similis*, from Suruga Bay. IV. Metacercariae of the Digenetic trematodes. *Jap. J. Parasit.*, 21 (5): 287–295.

SHIMAZU, T., 1975 a. On the parasitic organisms in a krill, *Euphausia similis*, from Suruga Bay. V. Larval Cestodes. *Jap. J. Parasit.*, 24 (3): 122–128 (in Japanese).

SHIMAZU, T., 1975 b. Some Cestode and Acanthocephalan larvae from Euphausiid crustaceans collected in the northern North Pacific Ocean. *Bull. Japanese Soc. Sci. Fish.*, 41 (8): 813–821 (in Japanese).

SHIMAZU, T. and T. OSHIMA, 1972. Some larval nematodes from euphausiid crustaceans. pp. 403–409. *In*: Takenouti et al. (ed.) *Biological Oceanography of the northern North Pacific Ocean*, Idemitsu Shoten, Tokyo.

SHIRAKI, T., H. HASEGAWA, M. KENMOTSU and M. OTSURU, 1976. Larval Anisakid nematodes from the prawns, *Pandalus* spp. *Jap. J. Parasit.*, 25 (3): 148–152.

SLUITERS, J. F., 1973. Study on the life-cycle of *Anisakis* sp. *Parasit.*, 67: 28.

SLUITERS, J. F., 1974. *Anisakis* sp. larvae in the stomachs of herring (*Clupea harengus* L.). *Z. Parasitenk.*, 44: 279–288.

SMITH, J. W., 1971. *Thysanoessa inermis* and *T. longicaudata* (Eupahusiidae) as first intermediate hosts of *Anisakis* sp. (Nematoda: Ascaridata) in the Northern North Sea, to the North Scotland and at Faroe. *Nature.*, 234 (5330): 478–481.

USPENSKAJA, A. V., 1960. Parasitofaune des crustaces Bentiques de la mer de Barents. *Ann. Parasit.*, 35 (3): 221–242.

VIVARES, C. P., 1971. Etude des parasites des crustacés décapodes brachyoures: Nématodes et larves des cestodes. *Ann. Parasit.*, 46 (1): 1–9.