[Jap. J. Parasit., Vol. 24, No. 2, 87-90, 1975]

Studies on the Amphibian Helminths in Japan
II. The Distribution of *Glypthelmins rugocaudata* (Yoshida, 1916) (Trematoda : Plagiorchiidae) in Japan and its new Hosts

AKIHIKO UCHIDA and HIROSHI ITAGAKI
Department of Parasitology, Azabu Veterinary College
Fuchinobe, Sagamihara 229, Kanagawa, Japan

(Received for publication ; Sep. 11, 1974)

More than 23 species of the genus *Glypthelmins* have been described in the world and most of them were collected in the countries except Japan where only one species, *Glypthelmins rugocaudata* (Yoshida, 1916) was reported. *G. rugocaudata* was first described by Yoshida in 1916 from a specimen of *Rana nigromaculata* obtained from the suburb of Osaka City. Since then, this fluke was found in Kyoto (Yamaguti, 1936), Osaka City (Yamashita, 1936) and Hiroshima, Japan (Yahata, 1934) and in Pyongyang, North Korea (Ogata, 1937).

In Japan *G. rugocaudata* has commonly been detected in the small intestine of *Rana nigromaculata* obtained in ponds, rivers and rice fields.

The Distribution of *G. rugocaudata* in Japan

Since 1969 the authors have examined 1,197 specimens of *Rana nigromaculata*, 320 of *R. rugosa*, 92 of *R. limnocharis*, 58 of *Bufo japonicus* and 1,250 of other species of frogs and newts collected in ponds, rivers and rice fields.

From the investigation it has been brought to light that this species of fluke is widely distributed in Japan.

I. *G. rugocaudata* from *R. nigromaculata*

As shown in Table 1, *R. nigromaculata* obtained from 25 localities was investigated and it was elucidated that the frogs from 20 of the localities were infected with this parasite. The infection rate was 100 % in Kozukue, Mikage (Kanagawa Pref.), Nanishi (Tokushima Pref.), Tomioka and Hitoyoshi (Kumamoto Pref.).

II. *G. rugocaudata* from *R. rugosa*

As shown in Table 2, *R. rugosa* obtained from 11 of 16 sites investigated was found infected with the parasite.

The infection rate was 100% in Sagamihara, Kozukue (Kanagawa Pref.), Matsuzaki (Shizuoka Pref.) and Tomioka (Kumamoto Pref.).

III. *G. rugocaudata* from other species of frogs and newts

In addition to the above two species of frogs some species of frogs and newts were examined for the fluke.

As a result two species of frogs, *R. limnocharis* (Numakuma, Hiroshima Pref., Aug. 1969 & 1970) and *Bufo japonicus* (Mt. Tanigawa, Gumma Pref., May 1973 and Oirase River, Aomori Pref., Aug. 1973) are added as the new hosts of *G. rugocaudata*.

The species and number of frogs and newts examined are shown in Table 3.

Discussion

The species of *Glypthelmins* have been reported from various regions of the world :

Table 1 Localities and infection rate of *G. rugocaudata* in *R. nigromaculata*

Prefecture	Locality	No. of frogs examined	No. of frogs infected	Infection rate (%)
1) Aomori	Minamitowada	5	0	0
2) Iwate	Karumai	58	6	9.3
3) Akita	Kisakata	12	4	33.3
4) Niigata	Shibata	43	4	9.3
5) Fukushima	Goshikinuma Lake	6	0	0
6) Ibaraki	Mito	20	1	5.0
7) Chiba	Narita	152	12	7.8
8) 〃	Hamakanaya	2	0	0
9) Kanagawa	Sagamihara	308	259	84.0
10) 〃	Kozukue	85	85	100.0
11) 〃	Mikage	15	15	100.0
12) Shizuoka	Matsuzaki	5	4	80.0
13) 〃	Hamamatsu	6	0	0
14) 〃	Iwata	56	45	80.0
15) Tokyo	Hachijo-Is.	7	0	0
16) Hyogo	Kato	6	1	16.6
17) 〃	Tanba	62	38	61.1
18) Tokushima	Nanishi	12	12	100.0
19) Hiroshima	Numakuma	86	71	82.5
20) 〃	Kinoe	52	43	82.6
21) Yamaguchi	Oshima-Is.	12	4	33.3
22) Kumamoto	Tomioka	52	52	100.0
23) 〃	Hitoyoshi	58	58	100.0
24) Miyazaki	Kijo	56	41	73.0
25) Kagoshima	Amami-Is.	21	10	47.6

U. S. A., Mexico, Brazil, Uruguay, Venezuela, Bolivia, Arzentina, England, the Philippines, Canton, Formosa, USSR and Japan.

The first species described is *G. quieta* which was reported by Stafford (1900) to be quite commonly parasitic in the frogs and toads, *Rana catesbiana*, *R. virescens*, *R. clamitans*, *R. sphenocephala*, *R. palustris*, *R. septentrionalis*, *Hyla pickeringii*, and Bufo spp., in U. S. A.

According to Yamaguti (1972) a number of amphibians have been recognized as the hosts of the genus *Glypthelmins*, namely; *Hyla pickeringii*, *H. regilla*, *H. crucifer*, *H. raniceps*, *Bufo marinus binaculatus*, *B. musicus*, *B. boreas*, *Bufo* spp., *Leptodactylus ocellatus*, *L. pentadactylus labyrinthicus*, *L. bolivianum*, *Leptodactylus* spp., *Pseudis paradoxa*, *P. nigrita*, *P. triseriata*, *Cystignathus ocellata*, *Ceratophrys coenuta*, *Chthonerpeton indistinctum*, *Rana catesbiana*, *R. virescens*, *R. clamitans*, *R. sphenocephala*, *R. palustris*, *R. septentrionalis*, *R. aurosa*, *R. boyli*, *R. pipiens*, *R. temporaria*, *R. palmopes*, *R. arenarum*, *R. vittigera*, *R. sphenocephala*, *R. nigromaculata*, and *R. rugosa*.

Glypthelmins rugocaudata has a fairly wide distribution in Japan, namely in the Tohoku, Kanto, Chubu, Kinki, San-yo, Shikoku and Kyushu districts of Japan proper. *Rana nigromauclata*, *R. rugosa*, *R. limuocharis* and *Bufo japonicus* act as the hosts of *G. rugocaudata* in Japan and the latter two species of hosts are new to science.

Table 2 Localities and infection rate of *G. rugocaudata* in *R. rugosa*

Prefecture	Locality	No. of frogs examined	No. of frogs infected	Infection rate (%)
1) Aomori	Minamitowada	2	0	0
2) Iwate	Karumai	12	7	58.3
3) Niigata	Shibata	23	5	21.7
4) Fukushima	Goshikinuma Lake	5	0	0
5) Chiba	Narita	5	0	0
6) 〃	Hamakanaya	10	0	0
7) Kanagawa	Sagamihara	52	52	100.0
8) 〃	Kozukue	2	2	100.0
9) Shizuoka	Matsuzaki	39	39	100.0
10) Tokyo	Hachijo-Is.	3	0	0
11) Hiroshima	Numakuma	41	28	68.2
12) 〃	Kinoe	11	4	36.3
13) Kumamoto	Tomioka	59	59	100.0
14) 〃	Hitoyoshi	16	11	68.7
15) Miyazaki	Kijo	34	19	55.8
16) Kagoshima	Amami-Is.	6	5	83.3

Table 3 The species of frogs and newts examined for *G. rugocaudata*

Species	No. examined	No. infected	Infection rate(%)
Triturus pyrrhogaster	578	0	0
T. pyrrhogaster ensicauda	103	0	0
Bufo japonicus	58	7	12.0
Hyla arborea pajonica	166	0	0
Rana japonica	152	0	0
R. ornativentris	34	0	0
R. catesbiana	25	0	0
R. limnocharis	92	76	82.6
Rhacophorus schlegelii	26	0	0
R. buergeri	16	0	0

Summary

Scince 1969 the authors have examined 1,197 specimens of *Rana nigromaculata*, 320 of *R. rugosa*, 92 of *R. limnocharis*, 58 of *Bufo japonicus* and 1,250 of other species of frogs and newts collected in ponds, rivers and rice fields for the fluke.

Rana nigromaculata, *R. rugosa*, *R. limnocharis* and *Bufo japonicus* act as the hosts of *G. rugocaudata* in Japan, and the latter two species of hosts (*Rana limnocharis*, *Bufo japonicus*) are new to science and is found in the Tohoku, Kanto, Chubu, Kinki, Sanyo, Shikoku and Kyushu districts of Japan proper.

References

1) Ogata, T. (1937) : [On the trematode parasitic in *Rana nigromaculata* from the region of Pyongyang, Korea.] Hakubutsugaku Zasshi 35(60), 278–282. (in Japanese)

2) Uchida, A. and Itagaki, H. (1974) : Studies on amphibian helminths in Japan. III. *Glypthel-*

mins rugocaudata (Yoshida, 1916), its new hosts, parasitic rate and geographical distribution in Japan. Jap. J. Parasit., 23(1) (Suppl.), 14.
3) Yahata, M. (1934) : Studies on the excretory system of *Glypthelmins rugocaudata* (Yoshida). J. Sci. Hiroshima Univ., Ser. B, Div. I. 3(7), 77-86.
4) Yamaguti, S. (1936) : Studies on the helminth fauna of Japan. Part 14. Amphibian trematodes. Jap. J. Zool., 6(4), 551-576.
5) Yamaguti, S. (1972) : Synopsis of digenetic trematodes of vertebrates. Part 2. Amphibian. Tokyo. 1074 pp.
6) Yamashita, J. (1936) : On the morphological srudy of *Glypthelmins rugocaudata* (Yoshida), a trematoda of the frog. Botany & Zoology, 4(8), 37-48.
7) Yoshida, S. (1916) : On a new species of frog trematode (*Enodiotrema rugocaudatum* n. sp.) Ann. Zool. Jap., 9, 73-79.

日本産両生類の寄生虫相
第2報 *Glypthelmins rugocaudata* (Yoshida, 1916) の日本における分布と新宿主の追加

内田明彦・板垣　博
(麻布獣医科大学寄生虫学教室)

1969年から日本各地より採取したトノサマガエル *Rana nigromaculata* 1,197匹，ツチガエル *R. rugosa* 320匹，ヌマガエル *R. limnocharis* 92匹，ヒキガエル *Bufo japonicus* 58匹，その他の両生類1,252匹を剖検した結果，*G. rugocaudata* は日本各地に分布していることが明かになった．

また，新宿主として広島県沼隈産のヌマガエルと群馬県谷川岳および青森県十和田市奥入瀬産のヒキガエルを追加する．