

Second Report of the Regular Limnological Survey of Lake Biwa (1967)

II. Zooplankton*

By

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The present paper is the second report on the zooplankton of the regular limnological survey of lake Biwa carried in 1967. The counts of the individual number per cubic metre on various zooplankters are listed on the tables 1 and 2. Both the compositions and the seasonal changes of the important components are fairly similar to those in the last report (1967). The annual changes will be studied in future with more numerous data. However, the author has to add short notes on two plankters.

First, a testacean rhizopod which was described in the last paper, as *Diffflugia brevicolla* Cash is identified as *Diffflugia (Pseudocucurbitella) pseudogramen* G. Lievre et Thomas, 1960, based on the later investigation.

Next point is on a species of plankton rotatoria, *Trichocerca chattoni* (de Beauchamp, 1907) (Fig. 1). The present species were collected from many localities in lake Biwa, when the fourth general survey was carried out bet-

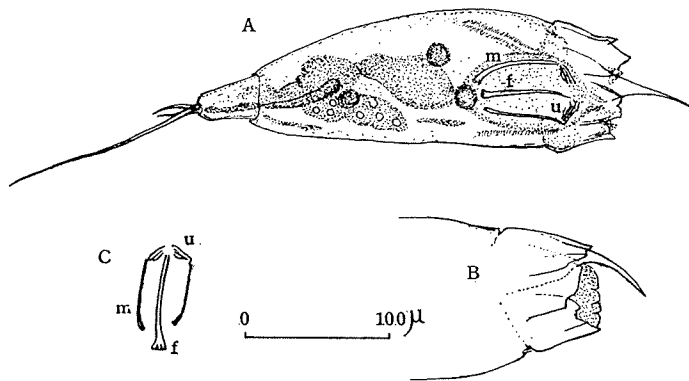


Fig. 1. *Trichocerca chattoni* (de Beauchamp)

A: dorsal view, (foot portion is side view, because the body is twisted.)

B: side view of the head portion.

C: trophi of an affined species *Trichocerca capucina*. (original)

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ween twentysecond and twentyfifth of July 1963. The status of distribution in the lake at that time is summarized in the table 3. In addition, it occurred in most cases above fifteen meters, especially abundant in the layer less than five meter depth, and was never collected from the neighbouring lagoons. After all, it is apparently an epilimnetic euplankton.

There had been no report of the present species in our country, until the author gave an oral presentation at the twenty ninth annual meetings of the Japanese Society of Limnology in 1964. Moreover, it is noteworthy that this species had been seldom reported in the world. That is to say, it was first described as a new variety of *Rattulus cylindricus* by de Beauchamp (1907), and next Hutchinson made it an independent species when he reported some African zooplankton (1911). Hauer (1938) described it when he studied the zooplankton of the German Sunda-Expedition. Hereupon, morphological character is briely given. When compared with an allied specie *Trichocerca cylindrica*, both the toe length and the toe body ratio are smaller and the body is thicker. A head process projects from a triangular plate, bending toward right and downward.

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(Received July 3, 1968)

	Station	1967											
		I-14	II-17	III-14	IV-17	V-16	VI-16	VII-15	VIII-15	IX-20	X-21	XI-16	XII-16
<i>Chydorus sphericus</i>	Nb2	-	-	-	-	-	-	-	-	-	-	-	-
	Nb5	-	-	100	-	-	-	-	-	-	-	-	-
	Na3	-	-	-	-	-	-	-	-	1500	250	-	500
<i>Alona guttata</i>	Nb2	-	-	-	-	-	-	-	-	-	-	-	-
	Nb5	-	-	100	-	-	-	-	-	-	-	-	-
	Na3	-	-	-	-	-	+	-	-	-	250	-	-
<i>Keratella cochlearis</i>	Nb2	-	-	-	200	2500	-	1000	2000	2800	1000	250	500
	Nb5	-	-	-	100	-	-	1000	11500	3200	4000	-	-
	Na3	-	-	25	-	6400	2500	-	17000	23000	32500	-	-
<i>Keratella quadrata</i>	Nb2	-	-	250	200	-	-	-	-	-	-	-	-
	Nb5	-	-	-	100	500	-	-	-	-	-	-	-
	Na3	-	-	-	-	-	-	-	-	-	-	-	-
<i>Brachionus angularis</i>	Nb2	50	-	-	400	2000	500	6000	7000	2400	-	-	-
	Nb5	-	-	-	-	-	-	3000	2000	1200	-	-	-
	Na3	-	-	-	-	400	-	-	19000	500	-	-	-
<i>Brachionus calyciflorus</i>	Nb2	300	75	1800	34800	1000	-	1000	-	-	-	-	-
	Nb5	100	25	200	400	-	-	16500	-	-	-	-	-
	Na3	-	50	25	-	-	-	-	-	-	-	-	500
<i>Brachionus quadridentatus</i>	Nb2	-	-	-	-	1000	-	-	-	-	-	-	-
	Nb5	-	-	-	-	-	-	2000	-	-	-	-	-
	Na3	-	-	-	-	-	-	500	-	-	-	500	-
<i>Polarthra vulgaris</i>	Nb2	200	125	1200	34800	5000	-	-	-	800	-	250	-
	Nb5	250	-	20600	2400	1000	-	500	1500	2000	3000	-	-
	Na3	-	50	5325	625	9200	10000	-	32000	5500	8750	400	-

	Station	1 9 6 7											
		I-14	II-17	III-14	IV-17	V-16	VI-16	VII-15	VIII-15	IX-20	X-21	XI-16	XII-16
<i>Synchaeta</i>	Nb2	3700	1575	3950	61800	-	-	-	-	-	-	-	-
<i>oblonga</i>	Nb5	6150	925	43700	8500	-	-	-	-	-	-	-	-
	Na3	+	775	-	4150	41200	47500	-	-	-	-	-	-
<i>Synchaeta</i>	Nb2	-	-	-	-	14500	1000	+	-	-	+	-	-
<i>stylata</i>	Nb5	-	-	-	-	4000	200	6000	-	+	-	-	-
	Na3	-	-	-	-	-	6500	-	1500	5000	4750	+	3000
<i>Ploesoma</i>	Nb2	-	-	-	-	500	500	1500	500	-	-	-	-
<i>truncatum</i>	Nb5	-	25	-	-	-	-	500	-	-	-	-	-
	Na3	-	-	-	-	92000	4000	1500	-	2500	-	-	-
<i>Asplanchna</i>	Nb2	300	+	-	1600	2500	-	-	-	-	-	-	-
<i>priodonta</i>	Nb5	150	-	-	-	500	-	-	-	-	-	-	-
	Na3	125	150	-	-	79200	-	-	-	-	-	-	500
<i>Euchlanis</i>	Nb2	-	-	-	-	1000	-	-	-	-	-	-	-
<i>dilatata</i>	Nb5	-	-	-	-	-	-	-	-	-	-	-	-
	Na3	-	-	-	-	1000	-	-	-	1000	250	-	-
<i>Diffugia</i>	Nb2	-	-	-	-	-	-	-	-	-	-	-	-
<i>pseudogramen</i>	Nb5	-	-	-	-	-	-	-	-	-	-	-	-
	Na3	-	-	-	-	-	-	-	-	500	-	-	-
<i>Diffugia</i>	Nb2	-	100	-	-	-	-	-	-	14000	-	-	-
<i>corona</i>	Nb5	-	-	-	-	-	-	-	6000	22000	-	-	-
	Na3	-	-	-	-	-	-	-	7000	7000	-	-	-
<i>Tintinnidium</i>	Nb2	-	-	700	-	-	-	-	-	-	-	-	-
<i>flaviatile</i>	Nb5	-	+	1300	-	-	-	-	-	-	-	-	+
	Na3	-	-	100	-	-	-	-	-	-	-	-	+
<i>Ceratium</i>	Nb2	-	25	-	800	500	1500	4500	-	800	-	-	-
<i>hirundinella</i>	Nb5	-	-	100	500	500	800	7500	1000	1600	-	-	-
	Na3	-	75	-	-	-	2000	2500	-	1000	-	-	-

Table 2 Zooplankton of northern basin (Ie-I) (n/m³)

	date depth	1 9 6 7							IX-19	X-20	XI-15	XII-15
		I-15	II-13	III-13	IV-14	V-16	VI-15	VII-17				
<i>Eodiaptomus</i> <i>japonicus</i>	0-2	600	-	750	54000	200	1500	—	7000	44000	31000	11500
	2-5	600	1000	38100	14200	8550	30400	13200	1500	95000	66500	6500
	5-10	1375	375	2625	7700	36800	65200	—	2000	225000	109000	4500
	10-20	3560	2600	3700	4700	9200	11100	1400	600	42000	17000	2600
	20-30	3180	1700	500	1200	220	575	25	200	1450	2400	1700
	30-50	2120	1550	450	1575	40	400	-	300	150	75	1550
<i>Mesocyclops</i> <i>leuckarti</i> & <i>Cyclops</i> <i>victinus</i>	50-70	1180	2300	50	—	400	150	12	75	50	-	75
	0-2	-	300	-	7800	-	1200	—	3000	8500	1500	3750
	2-5	-	-	1500	2200	450	-	-	1500	27500	8500	2000
	5-10	-	125	1875	2040	3200	400	—	500	72000	41000	1500
	10-20	190	375	2900	4000	1600	200	1300	700	39000	25500	600
	20-30	180	125	550	1000	200	700	825	600	3600	1500	500
<i>Nauplii</i>	30-50	310	310	425	1475	40	3400	500	400	400	1000	500
	50-70	125	250	175	—	75	2000	330	75	300	325	40
	0-2	4500	41100	115200	562200	2400	24300	—	66000	44000	207000	23000
	2-5	2400	21000	148500	76000	26400	7600	4400	13750	112500	62500	10750
	5-10	4000	10750	30750	26800	56400	4800	—	4750	84000	16300	6500
	10-20	1750	19300	44550	11100	5900	500	450	500	26500	48000	1800
	20-30	4800	8500	11450	3400	2150	75	25	50	2200	1500	1600
	30-50	2375	8200	10900	2650	400	-	12	200	1500	275	350
	50-70	1560	7000	4370	—	925	200	20	150	1750	50	100

[illegible]

	date depth	1 9 6 7											
		I-15	II-13	III-13	IV-14	V-16	VI-15	VII-17	VIII-16	IX-19	X-20	XI-15	XII-15
<i>Pompholyx</i> <i>complanata</i>	0-2	-	-	-	-	-	-	—	4500	-	-	-	-
	2-5	200	-	-	-	-	-	-	2500	-	-	-	-
	5-10	-	-	-	-	-	-	—	750	-	-	-	-
	10-20	-	-	200	-	-	-	-	50	-	-	-	-
	20-30	-	-	250	-	100	-	-	-	-	-	-	-
	30-50	-	-	-	-	10	-	-	-	-	-	-	-
	50-70	-	-	-	—	-	-	10	-	-	-	-	-
<i>Filinia</i> <i>longiseta</i>	0-2	-	-	-	-	-	-	-	750	-	-	-	-
	2-5	-	-	-	200	-	-	-	250	-	-	-	-
	5-10	-	-	-	-	200	-	-	-	-	-	-	-
	10-20	-	-	-	-	100	-	-	-	-	-	-	-
	20-30	-	-	-	-	-	-	-	-	-	-	-	-
	30-50	-	-	-	-	-	-	-	-	-	-	-	-
	50-70	-	-	-	-	-	-	-	-	-	-	-	-
<i>Trichocerca</i> <i>birostris</i>	0-2	-	-	-	-	-	-	—	500	-	-	-	-
	2-5	-	-	-	200	150	-	-	250	-	-	375	-
	5-10	-	-	-	-	200	-	—	250	-	-	100	-
	10-20	-	-	-	-	-	-	-	-	-	500	-	-
	20-30	-	-	-	-	-	-	-	50	-	-	-	-
	30-50	-	-	-	-	-	-	-	75	-	-	25	-
	50-70	-	-	-	-	-	-	-	-	-	-	-	-
<i>Trichocerca</i> <i>chattoni</i>	0-2	-	-	-	-	-	300	—	-	500	-	-	-
	2-5	-	-	-	-	-	800	800	-	-	-	-	-
	5-10	-	-	-	-	-	-	—	-	-	-	-	-
	10-20	-	-	-	-	-	-	200	-	-	-	-	-

	date depth	1 9 6 7											
		I-15	II-13	III-13	IV-14	V-16	VI-15	VII-17	VIII-16	IX-19	X-20	XI-15	XII-15
<i>Trichocerca</i> <i>capucina</i>	20-30	-	-	-	-	-	-	25	-	-	-	-	-
	30-50	-	-	-	-	-	-	-	-	-	-	-	-
	50-70	-	-	-	-	-	25	-	-	-	-	-	-
	0- 2	-	-	-	-	-	-	—	-	-	-	-	-
	2- 5	-	-	-	-	-	-	400	-	-	-	-	-
	5-10	-	-	-	-	-	-	—	-	-	1000	-	-
	10-20	-	-	-	-	-	-	-	-	-	500	-	-
	20-30	-	-	-	-	-	-	-	-	-	-	-	-
	30-50	-	-	-	-	-	-	-	-	-	25	-	-
	50-70	-	-	-	-	-	-	-	-	-	-	5	-
<i>Synchaeta</i> <i>oblonga</i>	0- 2	-	6900	9750	-	800	-	-	-	-	-	-	-
	2- 5	-	6800	600	-	300	-	-	-	-	-	-	-
	5-10	375	750	800	-	-	-	-	-	-	-	-	-
	10-20	125	1250	350	-	-	-	-	-	-	-	-	-
	20-30	-	2400	100	-	-	-	-	-	-	-	-	-
	30-50	-	750	-	-	-	-	-	-	-	-	-	-
	50-70	-	680	140	-	35	-	-	-	-	-	-	6
	0- 2	-	900	1200	600	-	20700	—	-	-	-	-	5750
	2- 5	200	400	900	-	-	1600	-	-	-	-	-	750
	5-10	125	-	125	-	200	-	—	-	-	-	-	1000
<i>Asplanchna</i> <i>priodonta</i>	10-20	250	625	250	-	600	500	200	1400	-	-	-	800
	20-30	60	300	-	-	100	75	-	750	200	-	-	400
	30-50	00	300	-	-	-	50	-	550	-	-	-	175
	50-70	-	125	-	-	10	50	-	-	-	-	-	7

	date depth	1967											
		I-15	II-13	III-13	IV-14	V-16	VI-15	VII-17	VIII-16	IX-19	X-20	XI-15	XII-15
<i>Ceratium</i> <i>hirundinella</i>	0-2	600	3000	1800	7200	-	-	-	6250	13500	-	-	-
	2-5	600	1800	1800	2000	-	-	5600	500	90000	-	-	-
	5-10	750	375	125	360	600	-	-	2250	10000	1000	-	-
	10-20	300	125	100	400	500	200	300	300	5000	-	-	-
	20-30	190	125	150	150	150	125	125	300	6150	100	-	-
	30-50	550	250	50	150	35	200	20	350	2875	-	-	-
<i>Diffugia</i> <i>corona</i>	50-70	-	-	30	-	60	150	25	125	2200	-	-	-
	0-2	-	-	-	-	-	-	-	-	-	-	-	250
	2-5	-	-	-	-	-	-	-	250	-	-	-	-
	5-10	-	-	-	-	-	-	-	-	-	-	-	-
	10-20	-	-	-	-	-	-	-	-	-	-	-	-
	20-30	-	-	-	-	-	-	-	-	-	-	-	50
<i>Diffugia</i> <i>pseudogramen</i>	30-50	-	-	-	-	-	-	-	-	-	-	-	-
	50-70	-	-	-	-	-	-	-	-	-	-	-	-
	0-2	-	-	-	-	-	2700	-	-	500	-	-	-
	2-5	-	-	-	-	-	1200	-	250	3750	-	-	-
	5-10	-	-	-	-	-	-	-	500	4000	-	-	-
	10-20	-	-	-	-	-	-	50	-	-	500	-	-
<i>Leptodora</i> <i>kindtii</i>	20-30	-	-	-	-	-	-	50	250	200	-	50	-
	30-50	-	-	-	-	-	-	-	350	25	-	-	-
	50-70	190	-	-	-	-	-	20	100	25	25	-	-
	0-2	-	-	-	-	-	-	-	-	-	-	-	-
	2-5	-	-	-	-	-	-	-	-	-	-	-	-
	5-10	-	-	-	-	-	-	-	-	-	-	-	-
	10-20	-	-	-	-	-	100	-	-	-	-	-	-

[illegible]

date depth	1 9 6 7											
	I-13	II-15	III-13	IV-14	V-16	VI-15	VII-17	VIII-16	IX-19	X-20	XI-15	XII-15
20-30	-	-	50	-	-	-	-	-	-	-	-	-
30-50	-	-	05	-	-	-	-	-	-	-	-	-
50-70	-	-	10	-	-	-	-	-	-	-	-	-

Table 3 *Trichocerca chattoni* in lake Blwa (July, 1963)

Regions		depth in m.	mean individual number/m ³			mean water temp.		
			0	2	5	0	1	5
Main basin	littoral zone	pelagial zone	1410 ± 990	2800 ± 1900		30°6	30°2	29°4C
		eastern coast	1510 ± 1300	990 ± 950		30°5	30°0	28°5
		northern coast	1980 ± 1140	1340 ± 920		28°4	28°3	27°8
		western coast	4060 ± 2000	1380 ± 960		28°8	27°3	26°8
Southern basin			6720 ± 3400	2090 ± 1140		29°7	29°5	29°0 (2m)