Preliminary Studies on the Rotatorian Fauna of Korea

Kokichi Yamamoto

INTRODUCTION

THOROUGH LIMNOLOGICAL SURVEYS in Korea have not been carried out up to the present time; only a few brief studies on the plankton, especially on the rotatorian fauna, have been made in several districts. There are papers relating to the Korean rotatorians published by five authors, namely, Kawamura (1917), Hada (1936), Ueno (1941), Sato (1939, 1941), and Yamamoto (1941). One of the reasons why such studies have been neglected is the paucity of lakes and ponds suitable for collections, except for a series of brackish-water lakes on the coast of the Japan Sea and reservoirs recently built for hydroelectric plants. The studies of the fresh-water fauna of Korea are quite incomplete when compared with those made on the fauna of Manchuria, which has been clarified by several researches under the direction of Professor T. Kawamura and summarized by Yamasaki (1940).

The author, accompanied by M. Ueno, made a trip for limnological work to the middle, eastern, and western districts of Korea from November 19 to 26, 1941. Since returning to the laboratory the author has engaged in a microscopical study of the rotatorians in the plankton obtained. At the same time, collections made by us in the preceding year in the northern part of Korea, as well as materials preserved in our laboratory, were examined. These latter consist of specimens which were collected by T. Kawamura during June, 1936, and by A. Tanaka in Lake Puchonho in 1931.

Through the courtesy of T. Kamita of Keijo Normal School, some plankton samples collected by T. Sato in the City of Keijo (Seoul) and the neighborhood were placed at my disposal for study. The rotatorians found in all these collections are reported upon in the following pages. Previous records are included in the list.

As the specimens treated here have been collected not only in a limited season but also from comparatively confined localities, they are not sufficient basis for a full discussion of the rotatorian fauna of Korea. The survey was to include different seasons and additional various localities, but the program was of necessity changed by the outbreak of war. Difficulties of travel had increased day by day, and finally the war made continuation of our survey in this peninsula impossible. Therefore, this report is based on limited material.

I wish to express my thanks to Doctor Ueno for his kind advice during the journey and in the research room.

LOCALITIES

The specimens examined were obtained from 16 bodies of water, which included all localities from which there are previous records. They are placed in four regions—northern, middle, eastern, and western—no collections having been made in the southern portion of the peninsula. The stations are shown on the sketch map in Figure 1. Table 1 shows some ecological data for the stations examined by Ueno and Yamamoto; such data.

1 Contribution No. 133 from the Otsu Hydrobiological Station of the University of Kyoto.

2 Otsu Hydrobiological Station, University of Kyoto. Manuscript received March 23, 1949.
Fig. 1. Map of Korean Peninsula showing the five main regions and the collection localities (1-16). (Heavy broken line indicates railways.)

are unavailable for the earlier collections by Tanaka, Kawamura, and Sato.
   This is a bog lake situated in the moorland of the Paik-mo high plateau, Ham-Gyon Puk Do. Pelagic (station 1a) and littoral (1b) plankton were collected. Some microorganisms were also obtained among the mosses of the surrounding swamp.
2. Lake Fusenko (cf. Ueno, 1941) (Puchon-ho).
   This is a gigantic reservoir for the hydroelectric plant which has dammed the river Puchon-gang, an upper tributary of the river Yalu. The collections by A. Tanaka (2b) from this lake were obtained during its early stages as a lake.
3. A small pond at Shochudan in Seoul.
5. Eitoho, southwestern suburb of Seoul.
   The potamoplankton was collected on the river in cross section at Tokuson, southeastern suburb of Seoul.
7. Seiko or West Lake, south of Seoul.
   One of the collections examined was made by T. Kawamura (7a) 5 years before our visit (7b). This lake was built artificially about 300 years ago at the foot of Mt. Reiki, imitating the site of Si-hu in Hangchow, China.
8. Kanggyong.
   Station 8a is a pond with luxuriant growth of water weeds among rice fields. Its surface area is about 100 square meters.
   Station 8b is an oxbow lake on the meandering lower reaches of the river Kum-gang.
9. Lake Kodoho (Kangdong-po).
   This brackish lake of medium area is situated near the coast of the Japan Sea. The collections were done at three stations, one being the center of the lake (9a), the next (9b) near "Jichudai," an island situated south of the center, and the last (9c) in the southern basin.
10. A pond near the Sanjippo railway station.
   On the east of the railway station there is a small pond with clear water in an area surrounded by granite rocks.
11. Lake Sanjippo (Sam-il-po).
   This lake is also situated in the granite area and has very clear water. The collection was made by using a boat at the southern extremity of the lake.
12. Lake Kanko (Kam-ho).
   This is a small pond which is situated among pine forests on the coast of the Japan Sea.
13. Inner Diamond Mountain (Kumgang san).
   The plankton was collected by Kawamura from the small pond of the Choanjii Temple.
   This small pond of badly contaminated water is historically famous. It is said that this pond was built nearly 2,000 years ago in
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TABLE 1
ECOLOGICAL DATA AT VARIOUS COLLECTION STATIONS IN KOREA

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the garden of the Royal Palace in Keishu (Kyongju).

15. A pond west of the Bukkokuju railway station.

Two kinds of collections were made, one from near the surface (15a) and the other from the bottom (15b).


The potamoplankton was collected on the river near Hangetsu-to (Halfmoon Island) in 5 minutes' upstream sailing.

SPECIES FOUND IN PRESENT MATERIAL

As the result of research on the materials from the stations mentioned above, 73 species (including 8 varieties and 7 forms) belonging to 10 families and 26 genera have been identified. Besides these there were several species impossible to identify because of the strong contraction of the body. Seven species, which appeared in the previous records, could not be found in the present examination. Thus, at present 83 species are known to occur in Korea. Although this is not a large number of species, it compares well with the number recorded from Japan.

In the following list the distribution within Korea is indicated by region and station. The known distribution in other parts of the Far East is also given. Species marked with an asterisk are not present in the material studied.

Order FLOSULARIACEA
Family CONOCHILIDAE
1. Conochiloides dossarius (Hudson) (M-8b) Japan, Manchuria, Sumatra, Bali.
2. Conochilus hippocrepis (Schrank) (N-1a, 1b, 2b; M-4) Japan, China, Manchuria.
3. Conochilus unicornis Rousselet (M-7a, 7b [Hada, 1936]) Japan, China, Manchuria.

Order PLOIMA
Family NOTOMMATIDAE
4. Monommata grandis Tessin (N-1b) Japan, Manchuria, Sumatra.
5.*Notommata sp. (N-1b).
7. Diaschiza gibba (Ehrenberg) (N-1b) Japan, China, Sumatra, Java.

Family SYNCHAETIDAE
8. Synchaeta longipes Gosse (M-7b).
9. Synchaeta oblonga Ehrenberg (N-2a; M-7b; E-9a, 9b, 9c, 15a) Japan.
10. Synchaeta tremula (O. F. Müller) (N-7b; E-9c) Japan, China, Java.
*Synchaeta spp. (N-2c; E-12, 14).
Family Asplanchnidæ

30. Asplanchna priodonta Gosse (N-2a, 2b, 2c; M-3, 5 [Sato, 1941], 7a, 7b [Hada, 1936], 8a, 8b; E-[Sato, 1941], 10, 13, 15a) Japan, China, Manchuria. Java.

Family Brachionidæ

31. *Brachionus angularis Gosse (E-[Sato, 1941]) Japan, China, Manchuria, Java.
32. Brachionus angularis var. bidens (Plate) (M-3, 8a, 8b) Japan.
33. Brachionus budapestinensis Daday (M-3) Japan, China, Manchuria, Formosa.
34. Brachionus calyciflorus Pallas (M-8a; E-14) Japan, China, Manchuria, Java.
35. Brachionus calyciflorus f. amphiberos Ehrenberg (M-3, 8a) Japan, China, Manchuria.
36. Brachionus calyciflorus f. anuraeiformis Brehm (M-3, 8a) Japan, China, Manchuria.
37. Brachionus calyciflorus var. dorcas Gosse (M-3, 8a) Japan, China, Manchuria.
38. Brachionus calyciflorus var. dorcas f. spinosus Wierzejski (M-3, 8a) Japan, China, Manchuria.
40. Brachionus quadridentatus Hermann (M-3; E-[Sato, 1941]) Japan, China, Manchuria, Java.
41. Brachionus quadridentatus var. brevispinus (Ehrenberg) (E-9c) Japan, China, Manchuria.
42. Brachionus ureolaris O. F. Müller (E-[Sato, 1941], 14) Japan, China, Manchuria.
43.*Platyias patulus (O. F. Müller) (M-[Hada, 1936]) Japan, China, Manchuria, Java, Bali.
44. Keratella cochlearis (Gosse) (N-2a, 2b; M-3, 5, 6, 7a, 7b [Hada, 1936], 8a, 8b; E-10, 13, 14, 15a, 15b) Japan, China, Manchuria, Java.
45. Keratella cochlearis var. macracantha (Lauterborn) (N-1a, 1b) Japan.
46. Keratella cochlearis var. tecta (Gosse) (N-2a;
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M-5, 7a, 7b [Hada, 1936], 8a, 8b; E-9b, 12, 14) Japan, China, Manchuria.

47. Keratella coccolariis var. tecta f. micracanthba (M-5, 7a, 7b).

48. Keratella cruciformis (Thompson) var. eichwaldi (Levander) (E-9a, 9b, 9c) Japan.

49. Keratella quadrata (O. F. Müller) (N-1b, 2a, 2c; W-16) Japan, China, Manchuria.


51. Keratella valga (Ehrenberg) f. asymmetrica Barrois et Dayad (M-3, 8b; E- [Sato, 1941]) Japan, China, Manchuria.

52. Keratella valga (Ehrenberg) f. monstrosa Barrois et Dayad (M-3, 5) Japan, China, Manchuria.

53. Keratella valga (Ehrenberg) f. tropica Apstein (E-9a, 9b, 9c, 12) Japan, China, Manchuria.

54. Notholca acuminata Ehrenberg (E-9a, 9c, 12) Japan, Manchuria.

55. Notholca labis Gosse (E-9b, 12) Japan.

56. *Anuraeopsis* sp. (M- [Hada, 1936]).

Family Euchlanidae

57. Euchlanis alata Voronkov (N-1b) Japan.

58. Euchlanis dilatata Ehrenberg (E-9a, 9b, 9c, 12, 14; W-16) Japan, China, Manchuria, Sumatra.

59. Euchlanis triqueta Ehrenberg (N-1b) Japan.

60. Lecane brachydactyla (Stenroos) (N-1b, 1c) Japan.

61. Lecane ludwigii (Eckstein) (E-15b) Japan, China, Manchuria, Sumatra, Java.

62. Lecane luna (O. F. Müller) (M- [Hada, 1936; Kawamura, 1917]; E-9b) Japan, China, Manchuria, Sumatra, Java.

63. Monostyla arcuata Bryce (M-8a) Japan, China, Manchuria, Sumatra.

64. Monostyla crenata Harring (N-1b) Japan, China, Manchuria, Java.

65. Monostyla hamata Stokes (N-1c) Japan, China, Manchuria, Sumatra, Java, Bali.

66. Monostyla lunaris (Ehrenberg) (N-1a, 1b; M- [Hada, 1936]; W-16) Japan, China, Manchuria, Sumatra, Java.

67. Monostyla pyriformis Dayad (E-11) Japan, Sumatra, Java.

68. Lepadella acuminata (Ehrenberg) (E-15b) Japan, Sumatra.

69. *Lepadella borealis* Harring (M- [Hada, 1936]).

70. Lepadella ovalis (O. F. Müller) (N-1b; E-12) Japan, China, Manchuria, Sumatra.

71. Colurella adriatica (Ehrenberg) (M-8b; E-9a) Japan, China.

72. Colurella leptata (Gosse) (E-9b, 9c) Japan, China.

73. Colurella obtusa (Gosse) (E-9a, 9b, 9c) Japan, China, Sumatra.

74. Mytilina trigona (Gosse) (N-1b) Japan.

75. Mytilina ventralis (Ehrenberg) (N-1b) Japan, China, Manchuria.

76. *Mytilina ventralis brevipina* (Ehrenberg) (M- [Hada, 1936]) Japan, China, Manchuria, Java.

77. Trichosria tetraetis (Ehrenberg) (N-1b) Japan, China, Manchuria, Sumatra, Java.

78. Trichosria truncata (Whitelegge) (M- [Hada, 1936], 8a; E-14, 15b) Japan, Manchuria.

Family Filinidae

79. Filinia longisetia (Ehrenberg) (N-2a, 2b; M-3, 5, 8a, 8b; E-9c, 15a) Japan, China, Manchuria, Sumatra, Java.

80. *Pedalia mira* (Hudson) (E- [Sato, 1941]) Japan, China, Manchuria, Sumatra.

Family Testudinellidae

81. Testudinella bidentata (Ternitz) (N-1a) Japan.

82. Testudinella patina (Hermann) (E-9a, 9b, 9c, 15b) Japan, China, Manchuria, Sumatra, Java.

Order Bdelloida

Family Philodinidae

83. *Rotaria* sp. (N-1c; E-9b, 10, 15b).

NoteWorthy Species

Brief descriptions of some unusual species which have been observed are given here.
The dorsal plate is larger than the ventral plate, is triradiate in cross section, and has a median keel. The sides are roundly expanded; in lateral view the highest portion is at the center, gradually decreasing in height anteriorly and decreasing suddenly near the posterior end. The ventral plate is slightly concave, about two thirds as wide as the dorsal plate. This species was found in the littoral region of Tai-taik (16).

**Testudinella bidentata** (Ternitz, 1892)

Pl. 3, Figs. 34, 34a

1892 *Pterodina bidentata* Ternitz, Rotatorien der Umgebung Basels, p. 20.

This species is nearly circular in shape. The dorsal plate has a convex frontal edge with a small central notch. On each side of the hind portion a small triangular projection is present, the tips of which are 100 micra apart. In the ventral plate the frontal edge is concave, but it swells out slightly centrally. A polygonal foot-opening is situated at the posterior extremity. In cross section (Fig. 34a), the ventral side is flat, but the dorsal side forms a low arc. This species was found in the region off the shore of Tai-taik (16). In Japan there is only a single record from the Koishikawa Botanic Garden of Tokyo (T. Kawamura).

**Plaesoma triacanthum** (Bergendal, 1892)

Pl. 3, Fig. 36


The anterior end of the head is separated into three triangular processes of which the central one is the longest. In general, this portion bends downward as a shield-like head. This species was found only in the littoral region of Tai-taik (16).

**Keratella cruciformis** (Thompson, 1892) var. *eichwaldi* Levander, 1894

Pl. 1, Fig. 14, 15

   Total length, 120 μ.

This brackish-water species was found in every part of Lake Kandong-po (9a, b, c). The hind process is absent. Both the punctate and reticulate sculptures are remarkable. In the dorsal lorica, the frontal plate is very short (c. 10 μ), but the first carinal plate is remarkably long (c. 75 μ).

**Keratella serrulata** (Ehrenberg, 1838)

Pl. 2, Fig. 20

1838 *Anuraea serrulata* Ehrenberg, Infusions-thierchen, p. 508.

Total length: 195 μ (from the frontal notch to the posterior end, 130 μ, length of the ventral plate, 120 μ). Width: frontal end 98 μ, greatest, 112 μ, hind end, 54 μ; frontal processes: central, 65 μ, sublateral, 22 μ, lateral, 25 μ.

Both the punctate and reticulate sculptures are remarkable in the dorsal plate. The last central plate is hexagonal, and from its posterior corner a central line runs posteriorly. Both posterior corners project slightly. The central pair of the frontal processes are long and stout, bending downward remarkably near the tip. This is a characteristic species of dystrophic water. Skadowski (1923) has found this species in moorland waters, in which the pH values ranged from 3.2 to 4.5. The pH value of the present locality (1b) measured as high as 6.3.

**DISTRIBUTIONAL RELATIONSHIPS**

As already noted, in the western region only a collection of potamoplankton was made, on the river Taidong-gang (16), where only five rotatorian species were found. This number is not small for a collection from a river, but there are very few individuals of the species, four of which were found in three other regions. Therefore, the fauna of the western region should not be considered here.

The species common to the three other regions number eight, or less than 10 per cent.

In general, these species are well known to be widely distributed animals. They are all pelagic except *Diurella tigris*. The frequencies of occurrence are as follows:

- *Polyarthra trigla* 12 stations
- *Keratella cochlearis* 10 stations
- *Keratella cochlearis var. tecta* 7 stations
- *Asplanchna priodonta* 9 stations
- *Filinia longiseta* 6 stations
- *Synchaeta oblonga* 4 stations
- *Trichocerca longiseta* 4 stations
- *Diurella tigris* 3 stations

The number of species peculiar to any one region of northern, middle, or eastern Korea are 17, 25, and 19, respectively. The total peculiar to one region, 61, is three fourths of the total number. Of the 13 species remaining, 8 are found both in the middle and eastern regions, 3 others are found both in the northern and middle regions. One species (*Lepadella ovalis*) is found in both the northern and the eastern regions.

The collections in northern Korea were made chiefly in summer. Seventeen species obtained from this region are, without exception, found only from Tai-taik. Only one from Tai-taik, *Keratella quadrata*, is also found in the collection from Puchon-ho, and in the Taidong-gang of the western region. This suggests that the conditions of Tai-taik differ greatly from those of any other waters visited. The occurrence of *Keratella cochlearis var. macracantha* is worthy of note as this collection was made in midsummer and this has been considered heretofore to be a winter form.

In Tai-taik 23 species of Rotatoria were found, i.e., 8 from the pelagic, 18 from the littoral, and 3 among the mosses of the marginal region.

In a work on the plankton of Lake Puchon-ho, the present author (1941) has noted that at the early stage of the development of the reservoir many helioplankters such as *Conochilus hippocrepis* were found, but after several years the condition of the water so changed that *Synchaeta* spp. and *Keratella quadrata* ap-
In July, 1941, *Asplanchna priodonta* was the predominant species, being especially abundant in the epilimnion. The nine species reported from this reservoir, excepting *Keratella quadrata*, are common to the middle and eastern regions.

In the middle region, three of the samplings were made by Sato from localities in and around Seoul. Among them, one from a pool at Shindo-cho (4) contained only a single species, *Conochilus hippocrepis*. The collections from a pool at Shochudan (3) and from Eitoh (5) contained 11 species each. A remarkable condition common to these two localities is the richness of species belonging to the family Brachionidae, i.e., eight from the former and six from the latter. It is particularly noteworthy that species of a warm-water type are found here, e.g., *Brachionus forficula* in the latter and *Keratella valga* in both localities.

As potamoplankton of the Hang-gang (6), only a single species (*Keratella cochlearis*) was found, but Sato (1939) has reported two species, *Asplanchna priodonta* and *Testudinella patina*, from the same river in winter.

Besides our collection from Seiko (7), those taken by Kawamura on June 2, 1936 (7a), were examined. Notwithstanding the fact that the season of collection was quite different, 11 species found in early summer were all included among the 18 species collected in
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PLATE I

(Line scales represent 100 micra except those marked otherwise)

Fig. 1. Polyarthra euryptera
Fig. 2. Polyarthra trigla
Fig. 3. Polyarthra trigla var. remata
Fig. 4. Polyarthra trigla var. major
Fig. 5. Conochiloides dossumius
Fig. 6. Brachionus angularis
Fig. 7. Brachionus angularis (type)
Fig. 8. Brachionus budapestinensis
Fig. 9. Brachionus forficula
Fig. 10. Brachionus calyciflorus
Fig. 11. Brachionus quadridentatus
Fig. 12. Keratella quadrate
Fig. 13. Keratella valga f. tropica
Fig. 14. Keratella cruciformis var. eichwaldi
Fig. 15. K. cruciformis var. eichwaldi (from Sakhalin, after Yamaguchi)
Fig. 16. Keratella cochlearis var. macracantha
late autumn. In both cases Asplanchna priodonta and Keratella cochlearis were found abundantly. The length of the posterior process of the latter species varies greatly, showing stages almost continuous from tecta-type to typica-type (Fig. 2). Polyarthra trigla shows a very wide distribution (Fig. 3). In the specimens from Seiko, two varieties were included (var. major and var. remata).

Of 17 species reported by Hada (1936) from this lake, 7 were also obtained in the present survey. They belong chiefly to the pelagic species, while the remainder are those of the creeping type. The occurrence of such bottom-inhabiting forms may be attributed to vertical hauls. The total number of species recorded from this lake is 28. This is the greatest number of species found in any single locality in Korea.

Seventeen species were found in two collections from Kanggyong. One collection from a small pond (8a) contained 13 species. Of these, Brachionus calyciflorus shows great variability, many types such as typica, amphiceros, anuraeiformis, dorcus, and spinosus being identified. Another collection from a pond (8b) contained 10 species, of which 7 are also found in pond 8a. No remarkable morphological characteristics can be found.

In the eastern region, the greatest number of species was found from Kangdong-po (9a, b, c). The total here is 23, if Sato’s (1941) record is added. The present collections were made from a small boat at three stations on the lake. Notholca occur in all three stations, Notholca acuminata in the first and third stations, and Notholca labis in the second. These species have been known as brackish-water forms and were also found in Lake Kam-ho (12).

Of eight species found in Kam-ho, six are also found in Kangdong-po.

The remaining two localities are located in the far southern region of eastern Korea, near the coast of the Japan Sea. An unnamed pond is situated to the west of the Bukkokuji railway station (14). Its area is considerable and it receives several brooks from the rice fields around it. Eight species were found both in the collections from the surface and in those from the bottom, the total being 14. There are two common species in these two places, one pelagic and the other a creeping species —Keratella cochlearis and Diurella tigris.

Throughout all the regions surveyed, the species belonging to the genus Keratella occur most frequently. The features of its distribution seem to be characteristic. Keratella cochlearis in both forms typica and var. tecta is distributed in the northern, middle, and eastern regions, whereas the remaining forms seem to be limited to a single region. K. quadrata, K. serrulata, and K. cochlearis var. macracantha are distributed chiefly in the northern region, K. cochlearis f. micracantha, K. valga f. asymmetrica, and f. monstrosa in the middle, and K. cruciformis var. eichwaldi and K. valga f. tropica in the eastern region. K. quadrata was, however, found also in the western region, and its forma asymmetrica has been recorded by Sato (1941) as a summer plankton animal of Kangdong-po.

It is remarkable that the distribution of species of southern origin, such as K. valga f. tropica, have shown a late autumn occurrence in the district of the Japan Sea coast. This suggests that the influence of the northward-flowing warm current along the coast of North Korea upon the climate of this district may be one of the factors acting in the distribution of this species. It is also interesting that, in spite of the collections having been made in the northern region in summer and in the southern region in late autumn, K. quadrata appears to be distributed strictly in the northern part and K. valga only from the southern region (Fig. 2).

Species belonging to the genus Brachionus occurred in comparatively few places. Two of these localities were the stations in and about the city of Seoul where the collections were made by Sato. In the present survey, Brachionus species were found in only three localities, i.e., Kanggyong, the Kangdong-po, and
PLATE II

(Line scales represent 100 micra except those marked otherwise)

Fig. 17. Keratella cochlearis var. tecta
Fig. 18a-c. Keratella cochlearis f. microcantha
Fig. 18d. Keratella cochlearis s. str.
Fig. 19. Keratella valga f. monstrosa
Fig. 20. Keratella serrulata
Fig. 21. Notholca acuminata
Fig. 22. Notholca labis
Fig. 23. Colorella leptata
Fig. 24. Colorella obtusa
Fig. 25. Lepadella acuminata (a: side view)
Fig. 26. Euchlanis alata (a: side view; b: frontal view)
Fig. 27. Euchlanis alata (wingless form)
Fig. 28. Euchlanis triquetra (a: cross section)
occurrences of this genus are limited to fewer localities. As is mentioned above, none of them was found in the northern region. As far as our collections are concerned, one species was found from the middle and two from the eastern region, a fourth was common to both. Besides these, two (budapestinensis and forficula) were found in the collections made by Sato. They are warm-water forms. Thus, a total of six species of Brachionus is known from the middle and eastern regions (Fig. 4).

SUMMARY

1. Plankton collections were made in Korea at 16 places, which may be classified roughly into four regions—the northern, western, middle, and eastern.

2. Fifty-eight species of Rotatoria were identified in these collections. In addition, seven species can be added from previous records. With the addition of eight varieties and seven forms, plus three undeterminable species, the total number becomes 83.

3. The species of wide distribution are Keratella cochlearis and Polyarthra trigla, both including several varieties or forms.

4. Species of Brachionus were found only in a few stations.

REFERENCES


PLATE III

(Line scales represent 100 micra except those marked otherwise)

FIG. 29. *Lepadella ovalis*
FIG. 30. *Lecane brachyactyla*
FIG. 31. *Monostyla lunaris*
FIG. 32. *Monostyla furcata*
FIG. 33. *Monostyla crenata*
FIG. 34. *Testudinella bidentata* (a: cross section)
FIG. 35. *Testudinella patina*
FIG. 36. *Plesoma triacanthum*
FIG. 37. *Diurella tigris* (a: head; b: toes)
FIG. 38. *Diurella porcellus*
FIG. 39. *Trichocerca cristata*
FIG. 40. *Trichocerca capucina*
FIG. 41. *Trichocerca pusilla*
FIG. 42. *Trichocerca longiseta*
FIG. 43. *Trichocerca cylindrica* (head)
FIG. 44. *Sturdiea eudactylotum*
FIG. 45. *Monommata grandis*