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OF THE FISHERIES ON LAKE
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RESULTS OF FISH POPULATION BIOLOGY STUDIES ON LAKE TANGANYIKA DURING JULY 1993-JUNE 1994

by

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PREFACE

The Research for the Management of the Fisheries on Lake Tanganyika Project (Lake Tanganyika Research) became fully operational in January 1992. It is executed by the Food and Agriculture organization of the United Nations (FAO) and funded by the Finnish International Development Agency (FINNIDA) and the Arab Gulf Programme for United Nations Development Organizations (AGFUND).

This project aims at the determination of the biological basis for fish production on Lake Tanganyika, in order to permit the formulation of a coherent lake–wide fisheries management policy for the four riparian States (Burundi, Tanzania, Zaïre and Zambia).

Particular attention will be also given to the reinforcement of the skills and physical facilities of the fisheries research units in all four beneficiary countries as well as to the buildup of effective coordination mechanisms to ensure full collaboration between the Governments concerned.

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1. INTRODUCTION

The main aim of the fish biology and fishery subcomponent of the LTR programme is to collect basic information on fisheries i.e. catch compositions and catch distribution of main target species as well as to estimate exploitation patterns and provide primary data for biological parameter estimation.

Lake Tanganyika’s pelagic fish community comprises six endemic species – *Lirnnothrissa miodon, Stolothrissa tanganicae* and four members of the genus Lates: *Lates angustifrons, Lates mariae, Lates microlepis* and *Lates stappersi.*

Three of these, *Limnothrissa miodon, Stolothrissa tanganicae* and *Lates stappersi,* are the main target species in artisanal, industrial and traditional fishery in Lake Tanganyika’s pelagic zone (Roest 1987, Coulter 1991; Bellemans 1991). Previously, the fishery of these pelagic species showed an increasing trend in catches and CPUE, and at present, these are still increasing lakewide because of the more efficient artisanal fishing units in use (Coenen 1994). The artisinal fishing fleet’s efficiency has improved as a result of the introduction of larger nets and canoes, as well as the motorization of the fleet and the introduction of ‘Apollo’ lift-nets in the northern part of the lake (Bellemans 1991). Artisanal fishery is carried out mainly using catamarans and trimarans, the total number of which has been estimated at about 12,700 units in the whole lake area (Hanek *et al*. 1993). A wide variety of fishing gears is used in traditional fishery i.e. gill nets, hook and line, long lines, traps and mosquito nets. According to Hanek *et al.* (1993), there are 55 industrial fishing units in the whole lake, but the number of active purse seiners is decreasing especially in the northern part of the lake (Burundi).

Because of the increase in total effort and the introduction of more effective fishing gears, there are already indications of local overfishing of stocks in some parts of the lake. However, in the main part of the lake the stocks are probably underexploited and a controlled increase of total effort might be allowed.

Since July 1993, the LTR project has provided enhanced possibilities for regular sampling of pelagic fish catches lakewide, covering the main fishing areas and fishing gears (artisanal units, industrial units, beach seines). Field stations and substations were established in 1993 for the project, and their personnel was trained to collect detailed data on pelagic fish catch composition and basic parameters such as mean weights at length groups and sexual maturity.

This report provides the results of the regular samples from July 1993 to June 1994.

2. MATERIAL AND METHODS

In late July 1993, the regular fish sampling programme started according the general guidelines presented in Aro (1993). The general sampling scheme was amended after the publication of the field manual (Mannini 1993), which was meant to standardise data collection and make sampling more flexible. This was necessary because of the differences in fishery in various parts of the lake. Commercial and artisanal catches have been sampled in Burundi (Bujumbura and Karonda), Zaïre (Uvira, Kalemie and Moba), Zambia (Mpulungu) and Tanzania (Kigoma and Kipili). In all sampling areas, the intention has been to take weekly samples from the main fishing gears (various types of lift nets, beach seine and purse seine) . Information on sampling areas and dates according to species is given in Tables 1-6.

3. RESULTS

In general, the weekly sampling was done almost as agreed, except in some areas where samples could not be obtained. In some periods the number of target species in commercial catches has been very low and thus there are no information available. For *Limnothrissa miodon,* sampling at permanent stations and sub-stations has not been adequate - in Uvira, April-May 1994, and in Kigoma January- February 1994 and April as well as June 1994. There are also some gaps in sampling for *Stolothrissa tanganicae* in Mpulungu and at sub-stations in Kalemie and Kipili. However, the information available from these sub–stations has proved to be very important. For *Lates stappersi,* some monthly samples are missing and these should be taken in the future. Although the western coast, and in particular, the central western part of Lake Tanganyika have been problematic for sampling, the whole lake has been fairly adequately covered.

3.1. CATCH COMPOSITION AND EXPLOITATION

A total of 439 catch samples of *Limnothrissa,* 443 catch samples of *Stolothrissa* and 429 catch samples of *Lates stappersi* were taken in the period from July 1993 to July 1994. The total numbers of catch samples according to species, area and month are given in Tables 1-3.

For analysis, all weekly samples were pooled according to species, giving monthly samples to provide a clearer picture of the length composition and the changes in main species month by month. All samples according to species, between July 1993 and June 1994, were also pooled, giving a yearly total to provide an overall exploitation pattern. The frequency and percentage distributions by main sampling areas, by month and as yearly totals are given in Tables 7–9.

Limnothrissa miodon

Limnothrissa is well represented in all sampling areas. The total numbers of specimens and catch per unit of effort are highest in the southern part of the lake and lowest in the north as Coenen (1994) also indicated. The minimum length of *Limnothrissa* observed in the catches in the northern part of the lake is at the same level as those in the southern part, but smaller than those in the central part. *Limnothrissa* is fully recruited to fishery at a length of about 65 mm (Table 7 and Figure 2), although areal differences exist.

There is a clear difference in length compositions in the northern, central and southern parts of the lake and also between samples taken in Uvira and Bujumbura (Table 7 and Figure 2). In the southern part of the lake, fishery is exploiting a wider range of length groups than in the northern part. The highest frequencies of specimens observed are already 30 mm long, whereas in the central part of the lake, the highest frequency observed occurs in the length group 80-89 mm.

The length composition of *Limnothrissa* in Uvira and Kigoma catches is rather similar. There is almost a total lack of immature and recruiting young *Limnothrissa* in the catch samples and catches show a peak in the length groups 100-109 mm and 110-119 mm respectively. In Bujumbura and Karonda, the main body of *Limnothrissa* specimens fall into the length group 40-99 mm and, especially in April and June, an incoming cohort could be seen in length compositions. The lift net catches from the Uvira and Kigoma areas look similar by length distribution, but they differ from those of Bujumbura and Kipili (Table 13 and Figure 3).

Beach seine catches show that exploitation in Bujumbura and Kigoma is directed mainly at the adult part of the stock, whereas in Kipili and Mpulungu, the beach seine also exploit the smaller length groups (Table 13 and Figure 4). This is very pronounced in Mpulungu catches. The same pattern also applies for purse seine catches (Table 13 and Figure 5). In the southern part of the lake young specimens are just more vulnerable to high exploitation because for example of use of mosquito nets as a cover to beach seines.

Stolothrissa tanganicae

Stolothrissa is also well represented in all sampling areas, however, there are some gaps in the sampling scheme in the central western and south–eastern parts of the lake (Table 8). The total numbers of specimens and catch per unit of effort are highest in those areas where the open pelagic zone is closest to the shore line (Uvira, Kigoma). In general, *Stolothrissa* seems to be more abundant than *Limnothrissa* (Coenen 1994) . The minimum length of *Limnothrissa* observed in the catches in the northern, central and southern parts of the lake is at the same level, varying from 20 mm in the north to 29 mm in the central part and 21 mm in the south. *Stolothrissa* is fully recruited to fishery at a length of about 62 mm, which is a little less than the *Limnothrissa* recruiting length (Table 8 and Figure 6), although differences between areas and gears do exist.

The overall catch composition (all gears combined) is similar lakewide, but different gears exploit stock differently, depending on the area. There is a clear difference in length compositions in lift net catches between Bujumbura and Kigoma (Table 14 and Figure 7). In the Kigoma region, lift net catches consist mainly of adult mature specimens and the catches peak in the length group 70-89 mm. In Bujumbura, the catches consist of smaller and thus younger, immature and maturing specimens (Table 14 and Figure 7). In Kipili and Mpulungu, there is a clear difference in beach seine catch compositions (Figure 8) because of the mosquito net cover applied in Mpulungu, and the purse seine catches in the Kigoma region are different from those in the southernmost part of the lake (Mpulungu) (Figure 9).

As with *Limnothrissa, Stolothrissa* fishery in the southern part of the lake also exploites a wider range of length groups than in the northern part. The length compositions of *Stolothrissa* in Uvira and Bujumbura catches are rather similar (Table 14). The number of adult *Stolothrissa* in Kalemie and Kigoma is much higher than in other areas (Table 14). The length distributions are clearly similar (Table 14) and the catch compositions in both areas peak in the length groups 70-79 mm and 80–89 mm.

In Bujumbura and Karonda, an incoming new cohort could be seen in catches in August-September 1993 and again in March-April 1994 (Table 8). This pattern is not clear in other areas, except in Mpulungu, where small specimens dominated both purse seine and beach seine catches in September-October 1993 (Table 8).

Comparing the catch compositions by different gears clearly shows that beach seine, even operated as a pelagic fishing gear, exploit the youngest and smallest part of the stock, whereas purse seiners use the adult part of the stock mainly (Table 14 and Figures 8-9). The lift net exploitation pattern is somewhat intermediate between these two (Figure 7). The general catch compositions thus indicate a smaller mean length in the catches in the northern and southern basins of the lake. In the central open part of the lake, the rate of exploitation is moderate or small.

Lates stappersi

Lates stappersi is not abundant in the northern part of the lake, and almost only immature specimens are observed in the catches in the northernmost area (Uvira and Bujumbura) (Table 9, Table 15 and Figure 10). The main distribution area of maturing and mature Lates stappersi seems to be in the central and, especially in the southern parts of the lake, although there are some gaps in the sampling scheme in the lake’s central western and south–eastern parts (Table 9).

The total number of specimens and catch per unit of effort is highest in the Mpulungu region. The minimum length of *Lates stappersi* observed in the catches in the northern part of the lake is 20-30 mm and the highest frequencies are observed in the length groups 90-99 mm and 100-109 mm.

In the Kigoma region, the catch composition is bimodal and smaller length groups dominate, especially in purse seine catches (Table 15 and Figure 12). The same pattern is observed in Kipili lift net catches (Figure 10). The purse seiners sampled in the Mpulungu region show a catch composition concentrated on bigger and older specimens, with only very few small immature Lates stappersi caught during the year (Table 9 and Figure 12). The overall catch composition (all gears combined) clearly shows the difference between the sampling areas and fishing gears (Table 15 and Figure 12).

3.2 REPRODUCTION AND MATURITY OGIVE

All available data was used to estimate reproduction patterns. To estimate maturity stages, a total of 330 samples of *Limnothrissa,* 338 samples of *Stolothrissa* and 223 samples of *Lates stappersi* were analysed. The total number of maturity samples according to species, area and month are given in Tables 4-6. The maturity ogives are given in Table 16. The maturity stages were classified according to the field manual (Aro 1993).

Limnothrissa miodon

Limnothrissa females grow larger than males. The sex ratio is similar lake–wide, except in samples from Bujumbura, where there is a strong domination of females (Table 10). The overall sex ratio is 1.94 (Table 10). Females reach maturity (maturity stages 3 and 4) at a length of 50-59 mm in the northern part of the lake, but in the Mpulungu region, the length at first maturity (first specimens attaining maturity) is 30-39 mm. Males ripen in the north at a length of 50-59 mm and in the south at a length of 30-39 mm (Table 10). A spawning peak (maturity stages 3 and 4) for *Limnothrissa* occurs from August to October in the Uvira and Bujumbura regions, with the highest number of spawning specimens observed at the beginning of October (Figures 13 and 14)

The females’ breeding activity pattern is not very clear in the Kigoma region, where, according to samples, 20–40% of females are ripening or ready to spawn all year round (Figure 13). On the other hand, males show a peak in April, but the amount of sampling is inadequate (Figure 14). A greater amount of ripening and spawning specimens is observed from May to September, but the pattern is unclear (Figures 13 and 14). In Mpulungu, the highest proportion of spawning specimens in females is observed in February and March (Figure 13). The males’ spawning activity pattern is not very clear (Figure 14). According to sampling, 50% of females are mature at a length of 90–94 mm and 50% of males at a length of 80-84 mm (Table 16).

Stolothrissa tanganicae

The ratio of females to males is also higher in the *Stolothrissa* population. The sex ratio in the northern part of the lake is 1.8 (females/males) and the proportion of females increases to the south where it is 2.4 in Mpulungu (Table 11). The highest number of spawning specimens in Bujumbura is observed in October-December (Table 11 and Figures 15 and 16). During the rest of the year, specimens are found in the early stages of gonadal development. Females reach maturity (maturity stages 2 and 3) at a length of 80-85 mm and males at a length of 70-75 mm.

In Kigoma waters, the overall percentage of mature specimens, at any given time, never reaches 50% in males and females. The proportion of immatures is rather high and the maximum is observed in May, when the proportion of immatures is 45%. Females and males reach maturity at a length of 70-79 mm lake–wide, and 50% of females and males are mature at a length of 75–79 mm (Table 16), although areal differences occur.

In the southern part of the lake, specimens start to mature earlier than in the northern part. The length at first maturity in the north is 45-49 mm, whereas in the Mpulungu region it is 30-39 mm. At the south end of the lake, sampling indicates that reproduction occurs throughout the year and no clear patterns are to be seen (Figures 15 and 16).

Lates stappersi

In the north of the lake, *Lates stappersi* specimens consist mainly of immatures and only some maturing and mature specimens are observed (Table 12). Adults are very rare. The amount of females is slightly higher than males in the *Lates stappersi* population, but he overall sex ratio is close to 1.0. In Mpulungu, the sex ratio is 1.2 (females/males) and in the Kigoma region, 1.0. (Table 12).

The highest number of spawning specimens in Mpulungu is observed in March (Table 12 and Figures 17 and 18) and in the Kigoma region, in August. Females reach 50% maturity at a length of 280–289 mm and males at a length of 260-269 mm. A high proportion of mature females is observed from November to April in Mpulungu (Figure 17) and in the south, at any given time, about half of the males are ripening or ready to spawn (Figure 18). In Kigoma, the highest proportion of reproducing males is observed in August and the number declines until March of the following year and increases again in April-June (Figure 19).

3.3 GROWTH AND LENGTH-WEIGHT RELATIONSHIPS

Von Bertalanffy growth parameters have been estimated for all target species using the data from main sampling areas. Only a selected sub–set of samples has been included in the analysis, as it was necessary to reject some data because in some areas, the number of samples was considered to be too small, no modal class projection was observed in the analysis or samples were not representative for parameter estimation. To estimate the growth parameter, the following methods were applied: ELEFAN I (Pauly and Morgan 1987), SLCA (Shepherd 1987) and projection matrix method (Basson et al 1988). The results are summarised in Tables 17a and 17b. In Tables 17a and 17b there are different grouping of length distribution data and analysis were made independently by both authors.

To facilitate the comparison of growth performances phi prime values (Pauly and Munro, 1984) are also included in the Table 17b.

All species show fast growth patterns which are quite similar lake-wide. As indicated by the constant K-values, *Stolothrissa tanganicae* has the fastest growth rate and thus shortest life span, about 1.5 years, with only very few specimens living up to two years. *Limnothrissa miodon* shows an almost identical growth pattern independently of the area (Table 17a and 17b). According to analysis, the maximum age of *Limnothrissa miodon* is about 2.6 years. Present material did not allow for the estimation of growth parameters for Lates stappersi in the northern part of the lake (Table 17a and 17b). The reason for this was that commercial catch samples consisted almost entirely of juveniles and the estimates were meaningless, only a part of the population is covered. Adults are very rare in artisanal and industrial catches (Tables 9 and 17a and 17b).

For length-weight relationships, all available mean length at length group data was used and data was pooled to give monthly samples from all sampling stations for all species. No differences in mean weight at length group was observed between the stations or months. The mean weight at length for all three species was estimated using the common allometric equation:

$$W=a*L^{b}$$

where W = observed mean weight (g) at length group (mm), L = observed mean length (mm) and a and b are constant. The solution used for a and b was an iterative least square technique which minimises the sum squares. The errors involved in using logarithmic transformation were observed to be small in all three cases, and no correction term was used in establishing final relationships. The results are summarised below and in Figures
19—21.

For *Limnothrissa miodon* the length weight relationship was as follows:

$$W =(4.252*10^{-6})*L^{3.124}$$

and the statistics and estimated parameters were:

Number of observations (N)	24
Regression coefficient (a)	$4.252*l0^{-6}$
Regression coefficient (b)	3.124
Correlation coefficient (r)	0.99
Correction factor (CF)	1.001
Relative error estimate (E)	1.022

Sum of squares errors:

Uncorrected:	32.509
Corrected:	32.076

For *Stolothrissa tan ganicae* the length weight relationship was:

$$W = (4.692*10^{-6})*L^{3.073}$$

and the statistics and estimated parameters were:

Number of observations (N)	13
Regression coefficient (a)	$4.692*10^{-6}$
Regression coefficient (b)	3.073
Correlation coefficient (r)	0.99
Correction factor (CF)	1.001
Relative error estimate (E)	1.042

Sum of squares errors:

Uncorrected:	2.547
Corrected:	2.577

For *Lates stappersi* the length weight relationship was estimated as follows:

$$W = (4.682*10^{-6})*L^{3.053}$$

and the statistics and estimated parameters were:

Number of observations (N)	85
Regression coefficient (a)	$4.682*10^{-6}$
Regression coefficient (b)	3.053
Correlation coefficient (r)	0.99
Correction factor (CF)	1.003
Relative error estimate (E)	1.019

Sum of squares errors:

Uncorrected:	22564.1
Corrected:	22688.4

All three species fit the allometric growth pattern well, as shown in Figures 19–21, where observed and predicted estimates are plotted.

3.4 MORTALITY RATES

All available data was used to estimate mortality rates. However, some monthly samples were omitted because the number of samples was considered to be too small or the samples were not representative of the estimation of mortalities. Preliminary estimates of total mortality (Z) and natural mortality (M) were attempted by using different methods. Results are reported in Tables 18a and 18b. Total mortality estimates obtained by length-converted catch curve (Pauly, 1983, 1984) are considered as reference values.

The total annual mortality (Z) rates were estimated using the method presented by Beverton and Holt (1956). This method uses estimates of K and L and the minimum length at full recruitment according to length distributions, then produces an estimate of Z for each distribution included in the analysis and a mean Z. The input length distributions are shown in Tables 7-9, the length groups used for mortality estimation, length at first capture and results are summarised in Table 18a.

Difficulties in estimating natural mortality are well known. Several methods have been used to approximate this parameter, they are empirical equations whose parameters are concerned, for example, with species longevity, growth performance, mean environmental temperature, age of massive sexual maturation. Therefore all of them are somehow related to the species growth. Natural mortalities were estimated according to Pauly's (1980) formula using a mean temperature, 25°C (Table 18b) and 27°C (Table 18a) for the whole lake area and all three species. The input data is presented in Table 17 and the results in Tables 18a and 18b. The estimated annual fishing mortality rates (F) are a subtraction of Z and M (Table 18a) .The exploitation rates were estimated as F/Z-ratios (Table 18a).

Stolothrissa exhibits, as expected, the highest natural mortality and annual average value was estimated to 3.6. *Limnothrissa* displays natural mortality which can be averaged from Pauly's equation as 2.0 annually . It falls between 1.8 and 2.3 per year when considering other available estimates. L. stappersii natural mortality assumes a mean value for the whole lake of 0.8 yr–l, as temperature input was kept constant (T = 25°C). Differences in M are explained by differences in growth parameters. Other methods estimate M values which are, although quite close, slightly superior to the above mean value.

For *Limnothrissa miodon,* the estimated total annual mortality rates are rather high, and mortality increases from north to south (Tables 18a and 18b). The highest annual fishing mortality rate is observed in the south (Mpulungu, F=3.53), giving a monthly fishing mortality rate of F=0.29. This means that 25% of the stock is removed monthly in this area by fishing. The exploitation rate is also highest in the southern part of the lake, indicating an intensive exploitation of stock. This is shown clearly by the composition of *Limnothrissa* catches by various gears and areas, as shown in Table 13. In Mpulungu, *Lirnnothrissa* is exploited at a very small size both by beach seines and purse seines, as shown in Table 13.

Stolothrissa tanganicae has the highest total mortality (Z), natural mortality (M) and fishing mortality rates lake-wide, except in the southernmost part of the lake, where the Limnothrissa fishing mortality rate (F) is virtually the same. The highest total annual mortality rate is observed in the northern part of the lake (Z range 4.2-7.8). Total mortality value of Z — 7.8 seems to be an overestimation.At the southern end of the lake, mortality is still high, but lower than in other areas (Table 18). The exploitation level ranges from 0.61 to 0.73, which is less than that observed in *Limnothrissa.* In the Kigoma region, the total annual mortality estimate, Z = 6.30 differs from the other areas because the length at first capture is 80 mm, as compared to 40 mm in other areas. The highest numbers of *Stolothrissa* in Kigoma catches are observed in the length group 70-89 mm, as indicated in Table 8. To include all length groups from 40 mm onwards in the analysis would give a total annual mortality rate as low as Z = 1.90, which is obviously an underestimate.

The total annual mortality rate of *Lates stappersi* ranges from a low level, Z = 0.57 in Mpulungu to a high level, Z = 2.65 in the Kigoma area (Table 18a and 18b). The estimated high mortality rates in the Kigoma region are explained by the recruitment of a new cohort into the purse seine fishery in that area and about half of the catches consisting of few length groups (Table 9 and Table 15). The exploitation rate decreases from high in Kigoma to moderate in Kipili and low in Mpulungu (Table 18). However, the simple catch curve analysis shows, that resulsts presented in Table 18a are likely to be underestimations and those total mortality rates presented in Table 18b are in good accordance with information on spatial distribution of fisheries and fleets as well as total effort.

Unforatunately, there are no total annual mortality estimates from the northern end of the lake because only immatures are represented in the catches there (Table 9).

4. CONCLUSIONS

4.1 CATCH COMPOSITION AND EXPLOITATION

Fishing on Lake Tanganyika is done mainly at night and clupeoids exhibit strong light attraction behaviour. *Lates* ssp. may also be attracted to fishing lamps, but their presence near fishing lamps is probably due to their predation behaviour at night (Ellis 1978). Fishery also uses the diurnal vertical migration pattern of clupeoids when they feed in the upper layer of pelagic zone at night. Thus the quality of clupeoid catch samples might be more representative than the samples taken simultaneously from Lates ssp. The present exploitation of three pelagic species in Lake Tanganyika according to catch samples taken between July 1993 – June 1994 are characterised as follows:

Limnothrissa miodon

Different types of liftnets exploit *Limnothrissa miodon* stock more heavily in the northernmost and southernmost parts of the lake and in the central part of the lake, exploitation is directed at the more mature part of the stock (Table 13). There are significant areal differences in liftnet catches. The liftnets used in Uvira and Bujumbura are fairly similar, and the difference could not be explained by selectivity of gears.

The obvious explanation is the difference between the topography of the coastal area and the behaviour of *Limnothrissa.* The littoral zone in Bujumbura and Karonda is much wider than in the Uvira and Kigoma areas, and *Limnothrissa* seems to be more coastbound than *Stolothrissa.* Beach seine catches in the north mainly exploit the mature part of the stock, whereas in the south, the main body of the catch consists of young immature specimens. Purse seine fishery does not occur in the northern part of the lake and the exploitation rate of juveniles in purse seine fishery increases from Kigoma to the southern areas, where more than a third of the total catch is taken as immatures.

The main reasons for these varying exploitation patterns are the differences in the composition of the fishing fleet, gear composition, the fleet’s total effort and obviously, differences in the distribution pattern of juveniles, recruiting cohorts and adults.

The general catch compositions show a decrease in mean length in the catches from north to south, with the exception of the catch composition in Burundi, which resembles the catch composition in the Kipili area (Figure 22). The areal exploitation pattern of *Limnothrissa* shows that in Burundi, Kipili and Mpulungu, catches are strongly based on the immature part of the stock, whereas in Uvira and Kigoma, it is the mature part of the stock which is almost exclusively exploited (Figure 22). This really indicates a much higher exploitation rate in the south, caused by a higher total effort and differences in the distribution pattern of the *Limnothrissa* population components.

Stolothrissa tanganicae

Stolothrissa tanganicae stock is heavily exploited by liftnets in the northernmost part of the lake and the exploitation is more moderate in the central and southern parts (Table 14). Beach seine are not used for *Stolothrissa* fishery in the north, but in the south, the main body of the catches consist of young immature specimens and in the Mpulungu area, about 70% of the catch is less than 50 mm in length (Table 14). Offshore purse seine fishery in the Kigoma region exploits the mature part of the stock, and the number of immatures in catches increases from Kigoma to Mpulungu.

The general catch compositions show an increase in mean length in the catches from north to south and in the southernmost part of the lake, fishery exploits a wider range of length groups than in the north, as was also indicated by the estimated mortality rates (Figure 23 and Table 18). The *Stolothrissa* areal exploitation pattern shows that in all areas, catches are strongly based on the immature part of the stock (Figure 23).

Lates stappersi

The catch composition of *Lates stappersi* varies greatly. These differences in the catch composition between Mpulungu, Kipili, Kigoma, Bujumbura and Uvira clearly indicate that the northernmost part of the lake and the Kigoma region serve as a nursery area for immatures and maturing specimens. At least part of the Lates stappersi immature stock inhabites these areas at any given time and immatures enter fishery in the central and southern parts of the lake at a minimum length of 55 mm (Kigoma region) and about 265 mm in the south.

Lates stappersi catches in the northern part of the lake (liftnet catches) are based entirely on immatures, mature specimens are sporadic in the catches (Table 15 and Figure 11). In the Kigoma region, the liftnet catch composition shows a weak bimodal pattern, which is pronounced in Kipili (Figure 24). Purse seine fishery shows a clear bimodal catch composition pattern in Kigoma and a monomodal pattern in Mpulungu (Figure 12). In Kigoma, purse seine catches are very much influenced by recruiting cohorts (Table 9). The general catch compositions show an increase in mean length in the catches from north to south (Figure 24).

The areal exploitation pattern of *Lates stappersi* shows that in Burundi, Uvira and Kigoma, catches and by—catches are based on the immature part of the stock, whereas in Kipili and especially in the Mpulungu region, catches are not dependent on recruitment and they are mainly based on mature stock (Figure 24). This also indicates a much more lower exploitation rate in the south, as indicated by mortality estimates (Table 18).

4.2 REPRODUCTION AND MATURITY OGIVE

The reproduction pattern and areal timing of peak spawning for all three species analysed is not very clear. The main reason for this might be the method used to determine the maturity stages and in the low number of samples available. The subjective criteria for maturity have obviously caused difficulties in maturity stage determination, especially between stages 2 and 3 and 5 and 2. As shown in Tables 4–6, the usable number and frequency of samples has only been obtained for Limnothrissa miodon in Bujumbura and Mpulungu, for *Stolothrissa tanganicae* in Bujumbura, Uvira and Kigoma and for *Lates stappersi* in Kigoma and Mpulungu. Thus it is too early to make lake–wide conclusions, only some first observations.

Limnothrissa miodon

The sex ratio for *Limnothrissa miodon* is similar lake–wide, with one exception, the Bujumbura area, where the females seem to dominate strongly (Table 10). Females reach maturity at a length of 50-59 mm in the north and in the south, the length at first maturity is 30-39 mm. The same maturation lengths also apply for males (Table 10). A spawning peak is observed from August to October in the Uvira and Bujumbura regions and the highest number of spawning specimens was observed at the beginning of October (Figures 13 and 14).

The breeding activity pattern of females is not very clear in the Kigoma region, where according to samples, 20-40% of females are ripening or ready to spawn all year round (Figure 13). In the southern end of the lake, the highest proportion of spawning specimens in females is observed in February and March (Figure 13). The spawning activity pattern of males is unclear (Figure 14). Compared to the information available on the reproduction cycle, our data show the same reproduction activity pattern as described by Ellis (1971) and Pearce (1985), but our present material showed no marked seasonal shift on the onset of maturity.

Stolothrissa tanganicae

In the northern part of the lake, the sex ratio of *Stolothrissa tanganicae* is 1.8 (females/males) and the proportion of females increases to the south (Table 11). In the northern areas, the highest number of spawning specimens is observed in October- December (Table 11 and Figures 15 and 16). Earlier works indicate that peak spawning during the calendar year occurs in August-December in the south (Coulter 1970a), January-April in the Kigoma region (Chapman and Van Well 1978) and February-May in the north (Roest 1977), but our material did not show this pattern. As shown earlier by Ellis (1971), females reach maturity at a length of 80-85 mm and males at 70-75 mm. In the central part of the lake, the overall percentage of mature specimens, at any given time, never reaches 50% in males and females. The general pattern shows that in the southern part of the lake, specimens start to mature earlier than in the northern part. In the north, the length at first maturity is 45-49 mm, and in the south, it is 30-39 mm. At the southern end of the lake, sampling indicates that reproduction occurs throughout the year and no clear patterns are to be seen. This was also shown by Ellis (1971)

Lates stappersi

The overall sex ratio for the *Lates stappersi* population is close to 1.0. In the south, the highest number of spawning specimens is observed in March (Table 12 and Figures 17 and 18) and in the Kigoma region, in August. Females reach 50% maturity at a length of 280-289 mm and males at 260-269 mm. In Mpulungu, a high proportion of mature females was observed from November to April (Figure 17), which agrees with earlier results (Pearce 1985). At any given time, about half of the males are ripening or ready to spawn in the southern part of the lake (Figure 18). In Kigoma, the highest proportion of reproducing males is observed in August, then the number declines until March of the following year and increases again in April-June (Figure 19).

4.3 GROWTH AND LENGTH-WEIGHT RELATIONSHIPS

The growth parameters estimated for *Limnothrissa miodon* indicate higher L and lower or similar K values than were estimated earlier by Pearce (1985) and Ndugumbi *et al*. (1976). For Zambian waters, Pearce (1985) reported L = 164 mm and K = 0.95 (period 1963–1983). Our estimates are 181 mm and 0.81 respectively. For the Kigoma region, Ndugumbi *et al*. (1976) (period 1974-75) reported L = 175 mm and K = 0.67 for specimens smaller than 120 mm and K = 0.92 for specimens bigger than 120 mm. Our estimates (Table 17) for Bujumbura and Karonda are L = 184 mm and K = 0.89.

For *Stolothrissa tanganicae,* our estimates of L vary from the lowest, 100 mm in the Kigoma region to 119 mm as the highest in the Mpulungu area. Our estimates for the growth coefficient K were 1.71 as the lowest (Kigoma) and 2.78, the highest (Uvira). Roest (1978) reported L = 93.8 mm and K = 2.52 (period 1972-1976) in Burundi and Chapman & Van Well (1978a) L = 90.0 mm and K = 2.52 in the Zambia area. Our estimates for the southern part of the lake are L = 119 mm and K = 2.48 in Zambian waters, higher than those estimated by Pearce (1985). Those growth coefficients (K = 1.59 and 1.56) estimated by Pearce (1985) are very low for a fast growing, short lived fish species like *Stolothrissa tanganicae.* Our estimate for the Kigoma region, K = 1.71 also falls into this low estimate category.

The material available did not allow us to estimate the growth parameters for *Lates stappersi* in the northern part of the lake. Estimates from literature show L values between 450–470 mm for the southern, central and northern parts of the lake (Pearce 1985, Chapman and Van Well 1978b, Roest 1985) and growth coefficients K between 0.39-0.40 per annum. Our estimates for the Kigoma area were higher for L and K respectively (Table 17) and for the southern part of the lake, higher for L and somewhat lower for K.

In the weight-length relationships estimated by the allometric growth equation, all three species fit the model well. The results are self explanatory and could be used in the future for the analysis of the productivity of the pelagic fish species.

4.4 MORTALITY RATES

The estimated total annual mortality rates for *Limnothrissa miodon* are rather high and increase from north to south. The highest annual fishing mortality rate was observed in the south (Mpulungu, F = 3.53), giving a monthly fishing mortality rate of F=0.29. Pearce (1985) estimated even 13 higher mortalities, F = 5.80, for Zambian waters for the period 1963–1983, giving a monthly mortality of 0.48. This means that during this period, total mortality has removed about 38% of fully recruited specimens from the stock monthly. Our present estimate indicates a total mortality of Z = 0.37 monthly (31% removals) and fishing has taken about 25% of the stock monthly in this area. In the Mpulungu area, Limnothrissa is exploited at a very small size by both beach seines and purse seines, as shown in Table 13.

Stolothrissa tanganicae has the highest total mortality (Z), natural mortality (M) and fishing mortality rates for almost the whole lake area. The highest total annual mortality rates we estimated (Z range 6.30-6.94) were observed in the northern part of the lake. Roest (1978) reported monthly instantaneous mortality rates between 2.76-5.52, depending on the size and age of the specimens. His figures do not compare directly with our results because in our data, the recruitment pattern is different. As indicated by the results, the mortality of Stolothrissa is still high in the south but lower than in other areas.

According to our analysis, the total annual mortality rate for Lates stappersi ranges from a low level, Z = 0.57 in Mpulungu, which is an underestimation to a range of Z = 1.61 – 1.98 in the Kigoma area and very high values in Mpulungu (2.31-2.58). Those mortalities reported by Pearce (1985) for Zambian waters are much higher than our estimates in Mpulungu and Kipili (Table 18a and 18b). For the Burundi and Tanzania areas, Henderson (1976) estimated a total mortality Z = 0.5 (Burundi, 1972–74) and Z = 1.2 (Tanzania, 1974–75). Our total mortality estimates for the Kigoma area are much higher. These mortality rates in the Kigoma region can be partly explained by the recruitment of a new cohort into the purse seine fishery in that area and probably by the emigration of mature specimens to southern areas, as indicated by the length composition of catches in Kipili and Mpulungu (Figure 24). The high mortality rates in the southern part of the lake are explained by the higher fishing pressure in the area.

5. FUTURE TASKS AND RECOMMENDATIONS

The results presented in this report are based on the continuous sampling of artisanal, commercial and industrial catches in Lake Tanganyika. The results describe the catch compositions of the three main pelagic species by area and by fleet. Results are based on catches made by artificial light attraction of target species and so should be considered with caution in relation to population parameters. However, the results give a fairly good picture of the overall fishing pattern around Lake Tanganyika.

In the near future, our results should be connected with available data on CPUE (Coenen 1994) and with total fishing effort by fleet estimates. Although there are some doubts about the usefulness of CPUE, in the case of a small pelagially shoaling fish, an analysis of links between catch composition and CPUE should be made available. Most of the Lake Tanganyika fishery is mixed and thus estimates of “how mixed is mixed fishery” are necessary.

There is also a vast amount of physical, chemical and biological information available, gained by other subcomponents of the LTR project, and a factor analysis or principal component analysis might be the avenue to take to find more explanations for the phenomena observed in Lake Tanganyika fisheries. There are certainly interactions between hydrological conditions and primary and secondary production as well as between zooplankton production and pelagic fish biomass. The next steps in the fish biology and fishery subcomponent of the project are to:

1. Include catch composition data from July 1994 - December 1994 in our primary database and rerun all analyses made so far with updated and completed data.

2. Connect all CPUE and total effort data with fish biology and fishery data without aggregating by area and fleet, if possible. Also, run analyses on area and fleet basis to estimate the distribution pattern of mortalities for management considerations.

3. Run an analysis on selectivity of various gears based on data already available.

4. Intensify and complete otolith readings and connect the results with fish biology data.

5. Include data on zooplankton and fish prey in the analysis.

6. Draft a detailed programme for a hydroacoustic–trawl survey for March-April and July-August 1995.

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Table 1. Total number of catch samples and *Limnothrissa miodon* specimens measured in July 1993-June 1994

Bujumbura	**Jul-93**	**Aug-93**	**Sep-93**	**Oct-93**	**Nov-93**	**Dec-93**	**Jan-94**	**Feb-94**	**Mar-94**	**Apr-94**	**May-94**	**Jun94**	**Year total**
No. samples	3	2	6	3	19	18	14	20	18	19	16	23	**161**
No. measured	190	15	676	63	5337	4978	1676	808	2086	1131	879	6679	**24518**
Uvira													
No. samples		4	4	4	4	3	4	2	5	1	5	7	**43**
No. measured		76	271	225	111	143	336	172	259	69	19	109	**1790**
Kigoma													
No. samples	3	5	8	5	8	6	2	1	4	1	8	6	**57**
No. measured	20	195	202	169	498	219	18	15	309	1	233	33	**1912**
Kipili													
No. samples	4		4	5		4	2	12		24	8	16	**79**
No. measured		943	964		53	529	342		2261	6310	2559	5003	**18964**
Mpulungu													
No. samples	10	4	10	6	2	12	7	7	9	10	11	11	**99**
No. measured	2306	1114	4022	1427	658	3179	883	1631	1943	2982	3805	3273	**27223**
Total no. of samples	**16**	**19**	**32**	**18**	**38**	**43**	**29**	**30**	**48**	**56**	**48**	**63**	**439**
Total number measured	**2592**	**2538**	**6089**	**1770**	**6689**	**9241**	**3091**	**2713**	**6668**	**10443**	**7585**	**16778**	**72617**

Table 2. **Total number of catch samples and *Stolothrissa tanganicae* specimens measured in July 1993-June 1994**

	Jul-93	Aug-93	Sep-93	Oct-93	Nov-93	Dec-93	Jan-94	Feb-94	Mar-94	Apr-94	May-94	Jun-94	Year total
Bujumbura													
No. samples	7	4	6	5	13	10	14	21	20	21	26	25	**172**
No. measured	1899	9386	8234	277	986	2170	8383	6393	3104	16478	16342	6610	**80262**
Uvira													
No. samples		4	1	3	6	4	3	5	5		14	10	**55**
No. measured		3925	16	270	482	342	260	1598	1033		4618	2020	**14564**
Kalemie													
No. samples						1	3	4		4	15		**27**
No. measured						340	1618	1789		3130	21853		**28730**
Kigoma													
No. samples	12	17	16	7	14	15	12	9	5	2	11	10	**130**
No. measured	4259	5929	5523	2168	4198	4343	3824	1762	809	549	3895	2281	**39540**
Kipili													
No. samples		2	1		5	3	1				5		**17**
No. measured		455	276		408	44	1				113		**1297**
Mpulungu													
No. samples	7	3	7	4	1	5	6	3	4		1	1	**42**
No. measured	1506	411	2781	1002	10	434	842	236	78		15	122	**7437**
Total no. of samples	**26**	**30**	**31**	**19**	**39**	**38**	**39**	**42**	**34**	**27**	**72**	**46**	**443**
Total number	**7664**	**20106**	**16830**	**3717**	**6084**	**7673**	**14928**	**11778**	**5024**	**20157**	**46836**	**11033**	**171830**

Table 3. **Total number of catch samples and *Lates stappersii* specimens measured in July 1993-June 1994**

	Jul-93	Aug-93	Sep-93	Oct-93	Nov-93	Dec-93	Jan-94	Feb-94	Mar-94	Apr-94	May-94	Jun-94	Year total
Bujumbura													
No. samples	5		1	6	6	6	6	7	9	2	6	11	**65**
No. measured	674		5	795	317	45	115	47	131	98	30	349	**2606**
Uvira													
No. samples		4	5	4	5	3	3	3	5		11	7	**50**
No. measured	0	55	105	38	267	66	160	81	465		885	126	**2248**
Moba													
No. samples											2		**2**
No. measured											1768		**1768**
Kigoma													
No. samples	4	9	8	7	6	3	8	8	10	3	11	11	**88**
No. measured	29	182	265	378	407	124	308	765	1273	317	850	847	**5745**
Kipili													
No. samples					20	21	21	31	20			13	**126**
No. measured					678	532	232	340	626			388	**2796**
Mpulungu													
No. samples	3	6	5	8	10	9	16	10	14	6	6	5	**98**
No. measured	177	1101	500	2018	1891	1330	3192	2016	2577	1236	884	1207	**18129**
Total no. of samples	**12**	**19**	**19**	**25**	**47**	**42**	**54**	**59**	**58**	**11**	**36**	**47**	**429**
Total number measured	**880**	**1338**	**875**	**3229**	**3560**	**2097**	**4007**	**3249**	**5072**	**1651**	**4417**	**2917**	**33292**

Table 4. **Total number of samples and *Limnothrissa miodon* specimens analysed for maturity stage in July 1993-June 1994**

	Jul-93	Aug-93	Sep-93	Oct-93	Nov-93	Dec-93	Jan-94	Feb-94	Mar-94	Apr-94	May-94	Jun-94	Year total
Bujumbura													
No. samples	3	2	6	3	14	16	14	18	15	14	16	17	**138**
No. measured	110	11	130	62	574	1323	603	454	771	439	391	1078	**5946**
Uvira													
No. samples		4	4	4	4	4	4	2	6		1	7	**40**
No. measured		75	271	225	112	205	333	172	328		80	73	**1874**
Kigoma													
No. samples	2	5	8	5	9	6	2	1	4	1	8	5	**66**
No. measured	2	81	129	94	217	170	18	15	260	1	87	20	**1094**
Mpulungu													
No. samples	10	4	10	6	2	12	5	6	9	10	11	11	**96**
No. measured	501	158	739	336	101	619	302	617	738	542	346	531	**5530**
Total no. of samples	**16**	**16**	**28**	**18**	**29**	**38**	**25**	**27**	**34**	**25**	**36**	**40**	**330**
Total number analysed	**613**	**325**	**1269**	**717**	**1004**	**2317**	**1266**	**1258**	**2097**	**982**	**904**	**1702**	**14444**

Table 5. **Total number of samples and *Stolothrissa tanganicae* specimens analysed for maturity stage in July 1993-June 1994**

Bujumbura	Jul-93	Aug-93	Sep-93	Oct-93	Nov-93	Dec-93	Jan-94	Feb-94	Mar-94	Apr-94	May-94	Jun-94	Year total
No. samples	7	2	6	5	12	4	8	16	14	14	15	12	**115**
No. measured	267	148	325	130	327	102	217	517	401	696	724	556	**4410**
Uvira													
No. samples		2	1	3	6	4	3	5	5		15	10	**54**
No. measured		165	16	270	440	334	231	552	290		1546	450	**4294**
Kalemie													
No. samples										4			**4**
No. measured										273			**273**
Kigoma													
No. samples	9	15	16	7	14	15	12	10	5	5	11	10	**129**
No. measured	478	1141	1016	525	1026	899	760	505	229	316	631	447	**7973**
Mpulungu													
No. samples	7	3	7	4	1	5	4	3	4		1	1	**40**
No. measured	342	125	375	205	10	212	210	113	66		15	50	**1723**
Total no. of samples	**23**	**22**	**30**	**19**	**33**	**28**	**27**	**34**	**28**	**19**	**42**	**33**	**338**
Total number analysed	**1087**	**1579**	**1732**	**1130**	**1803**	**1547**	**1418**	**1687**	**986**	**1012**	**2916**	**1503**	**18400**

Table 6. **Total number of samples and *Lates stappersii* specimens analysed for maturity stage in July 1993-June 1994**

Bujumbura	Jul-93	Aug-93	Sep-93	Oct-93	Nov-93	Dec-93	Jan-94	Feb-94	Mar-94	Apr-94	May-94	Jun-94	**Year total**
No. samples	5			6	5				2			6	**24**
No. measured	82			111	75				31			73	**372**
Uvira													
No. samples		1	4	1	5	3	3	3	3		2	6	**31**
No. measured		3	104	1	88	43	139	37	128		90	16	**649**
Kigoma													**NJ**
No. samples	4	8	4	6	4	2	6	8	9	3	6	8	**68**
No. measured	15	161	69	179	17	36	240	236	513	136	149	251	**2002**
Mpulungu													
No. samples	9	6	5	8	10	7	13	11	14	6	6	5	**100**
No. measured	96	564	330	974	1133	756	1514	1396	1536	652	428	368	**9747**
Total no. of samples	**18**	**15**	**13**	**21**	**24**	**12**	**22**	**22**	**28**	**9**	**14**	**25**	**223**
Total number analysed	**193**	**728**	**503**	**1265**	**1313**	**835**	**1893**	**1669**	**2208**	**788**	**667**	**708**	**12770**

Table 7. Limnothrissa miodon catch composition. Total numbers in samples and % distributions (gears combined) in various sampling areas in July 1993-June 1994.

Bujumbura

Length group (mm)	Jul.93 N	Aug.93 N	Sep.93 N	Oct.93 N	Nov.93 N	Dec.93 N	Jan.94 N	Feb.94 N	Mar.94 N	Apr.94 N	May.94 N	Jun.94 N	Total N
10-19	0	0	5	0	0	0	0	0	0	0	0	0	5
20-29	0	0	146	0	0	0	1	0	0	12	0	14	173
30-39	0	0	5	0	2	118	0	0	0	92	0	1641	1858
40-49	0	0	146	0	183	378	50	0	85	60	8	2799	3709
50-59	5	0	259	0	1373	861	345	0	583	101	165	552	4244
60-69	12	0	7	0	2099	1762	240	9	189	304	96	581	5299
70-79	82	0	35	0	880	823	318	82	146	204	95	227	2892
80-89	72	6	48	2	535	306	266	211	421	196	92	281	2436
90-99	15	8	21	7	197	594	266	305	544	113	167	355	2592
100-109	3	1	4	8	49	117	143	134	105	39	181	144	928
110-119	0	0	0	11	10	17	20	39	12	5	66	75	255
120-129	1	0	0	24	8	2	17	20	1	5	9	9	96
130-139	0	0	0	10	1	0	6	5	0	0	0	1	23
140-149	0	0	0	1	0	0	2	2	0	0	0	0	5
150-159	0	0	0	0	0	0	2	1	0	0	0	0	3
160-169	0	0	0	0	0	0	0	0	0	0	0	0	0
170-179	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	**190**	**15**	**676**	**63**	**5337**	**4978**	**1676**	**808**	**2086**	**1131**	**879**	**6679**	**24518**

Length group (mm)	Jul.93 %	Aug.93 %	Sep.93 %	Oct.93 %	Nov.93 %	Dec.93 %	Jan.94 %	Feb.94 %	Mar.94 %	Apr.94 %	May.94 %	Jun.94 %	Total %
10-19	0.00	0.00	0.74	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
20-29	0.00	0.00	21.60	0.00	0.00	0.00	0.06	0.00	0.00	1.06	0.00	0.21	0.71
30-39	0.00	0.00	0.74	0.00	0.04	2.37	0.00	0.00	0.00	8.13	0.00	24.57	7.58
40-49	0.00	0.00	21.60	0.00	3.43	7.59	2.98	0.00	4.07	5.31	0.91	41.91	15.13
50-59	2.63	0.00	38.31	0.00	25.73	17.30	20.58	0.00	27.95	8.93	18.77	8.26	17.31
60-69	6.32	0.00	1.04	0.00	39.33	35.40	14.32	1.11	9.06	26.88	10.92	8.70	21.61
70-79	43.16	0.00	5.18	0.00	16.49	16.53	18.97	10.15	7.00	18.04	10.81	3.40	11.80
80-89	37.89	40.00	7.10	3.17	10.02	6.15	15.87	26.11	20.18	17.33	10.47	4.21	9.94
90-99	7.89	53.33	3.11	11.11	3.69	11.93	15.87	37.75	26.08	9.99	19.00	5.32	10.57
100-109	1.58	6.67	0.59	12.70	0.92	2.35	8.53	16.58	5.03	3.45	20.59	2.16	3.78
110-119	0.00	0.00	0.00	17.46	0.19	0.34	1.19	4.83	0.58	0.44	7.51	1.12	1.04
120-129	0.53	0.00	0.00	38.10	0.15	0.04	1.01	2.48	0.05	0.44	1.02	0.13	0.39
130-139	0.00	0.00	0.00	15.87	0.02	0.00	0.36	0.62	0.00	0.00	0.00	0.01	0.09
140-149	0.00	0.00	0.00	1.59	0.00	0.00	0.12	0.25	0.00	0.00	0.00	0.00	0.02
150-159	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.12	0.00	0.00	0.00	0.00	0.01
160-169	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
170-179	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**

Table 7. (cont) Limnothrissa miodon catch composition. Total numbers in samples and % distributions (gears combined) in various sampling areas in July 1993-June 1994.

Uvira

Length group (mm)	Jul.93 N	Aug.93 N	Sep.93 N	Oct.93 N	Nov.93 N	Dec.93 N	Jan.94 N	Feb.94 N	Mar.94 N	Apr.94 N	May.94 N	Jun.94 N	Total N
10-19		0	0	0	0	0	0	0	0	0	0	0	0
20-29		0	0	0	0	0	0	0	0	0	0	0	0
30-39		0	0	0	0	0	0	0	0	0	0	0	0
40-49		0	0	0	0	0	0	0	0	0	0	0	0
50-59		0	0	0	0	1	0	0	0	0	0	0	1
60-69		4	0	0	0	4	0	0	0	0	0	0	8
70-79		6	0	0	2	1	0	2	0	0	0	0	11
80-89		16	35	9	17	16	11	28	17	0	1	0	150
90-99		30	126	67	45	74	87	57	148	239	1	10	884
100-109		15	88	86	33	39	145	68	110	508	3	50	1145
110-119		3	20	47	10	4	77	14	44	464	6	47	736
120-129		2	2	14	4	3	16	2	9	186	7	1	246
130-139		0	0	2	0	1	0	1	0	12	1	1	18
140-149		0	0	0	0	0	0	0	0	0	0	0	0
150-159		0	0	0	0	0	0	0	0	0	0	0	0
160-169		0	0	0	0	0	0	0	0	0	0	0	0
170-179		0	0	0	0	0	0	0	0	0	0	0	0
Total		76	271	225	111	143	336	172	328	1409	19	109	3199

Length group (mm)	Jul.93 %	Aug.93 %	Sep.93 %	Oct.93 %	Nov.93 %	Dec.93 %	Jan.94 %	Feb.94 %	Mar.94 %	Apr.94 %	May.94 %	Jun.94 %	Total %
10-19		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20-29		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30-39		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
40-49		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
50-59		0.00	0.00	0.00	0.00	0.70	0.00	0.00	0.00	0.00	0.00	0.00	0.03
60-69		5.26	0.00	0.00	0.00	2.80	0.00	0.00	0.00	0.00	0.00	0.00	0.25
70-79		7.89	0.00	0.00	1.80	0.70	0.00	1.16	0.00	0.00	0.00	0.00	0.34
80-89		21.05	12.92	4.00	15.32	11.19	3.27	16.28	5.18	0.00	5.26	0.00	4.69
90-99		39.47	46.49	29.78	40.54	51.75	25.89	33.14	45.12	16.96	5.26	9.17	27.63
100-109		19.74	32.47	38.22	29.73	27.27	43.15	39.53	33.54	36.05	15.79	45.87	35.79
110-119		3.95	7.38	20.89	9.01	2.80	22.92	8.14	13.41	32.93	31.58	43.12	23.01
120-129		2.63	0.74	6.22	3.60	2.10	4.76	1.16	2.74	13.20	36.84	0.92	7.69
130-139		0.00	0.00	0.89	0.00	0.70	0.00	0.58	0.00	0.85	5.26	0.92	0.56
140-149		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
150-159		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160-169		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
170-179		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		100	100	100	100	100	100	100	100	100	100	100	100

Table 7. (cont) Limnothrissa miodon catch composition. Total numbers in samples

Table 7. (cont) Limnothrissa miodon catch composition. Total numbers in samples and % distributions (gears combined) in various sampling areas in July 1993-June 1994.

Kigoma

Length group (mm)	Jul.93 N	Aug.93 N	Sep.93 N	Oct.93 N	Nov.93 N	Dec.93 N	Jan.94 N	Feb.94 N	Mar.94 N	Apr.94 N	May.94 N	Jun.94 N	Total N
10-19	0	0	0	0	0	0	0	0	0	0	0	0	0
20-29	0	0	0	0	0	0	0	0	0	0	0	0	0
30-39	0	1	0	0	0	0	0	0	0	0	0	0	1
40-49	0	0	0	0	0	0	0	0	0	0	0	0	0
50-59	0	0	0	0	0	0	0	0	0	0	0	0	0
60-69	0	0	0	0	0	0	0	0	0	0	0	0	0
70-79	0	0	0	0	0	0	0	0	0	0	0	0	0
80-89	1	0	0	3	1	0	0	0	2	0	4	2	13
90-99	0	2	0	32	10	2	0	2	5	0	3	0	54
100-109	6	26	11	110	83	19	0	5	60	0	53	9	369
110-119	10	33	31	21	68	69	7	4	71	0	139	5	464
120-129	2	15	40	3	191	68	6	2	34	1	26	10	394
130-139	0	61	59	0	125	43	5	1	36	0	5	7	327
140-149	0	46	49	0	16	14	0	1	55	0	2	0	197
150-159	1	11	11	0	4	3	0	0	34	0	1	0	75
160-169	0	0	1	0	0	1	0	0	12	0	0	0	18
170-179	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	**20**	**195**	**202**	**169**	**498**	**219**	**18**	**15**	**309**	**1**	**233**	**33**	**1912**

Length group (mm)	Jul.93 %	Aug.93 %	Sep.93 %	Oct.93 %	Nov.93 %	Dec.93 %	Jan.94 %	Feb.94 %	Mar.94 %	Apr.94 %	May.94 %	Jun.94 %	Total %
10-19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20-29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30-39	0.00	0.51	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05
40-49	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
50-59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
60-69	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
70-79	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
80-89	5.00	0.00	0.00	1.78	0.20	0.00	0.00	0.00	0.65	0.00	1.72	6.06	0.68
90-99	0.00	1.03	0.00	18.93	2.01	0.91	0.00	13.33	1.62	0.00	1.29	0.00	2.82
100-109	30.00	13.33	5.45	65.09	16.67	8.68	0.00	33.33	19.42	0.00	22.75	27.27	19.30
110-119	50.00	16.92	15.35	12.43	13.65	31.51	38.89	26.67	22.98	0.00	59.66	15.15	24.27
120-129	10.00	7.69	19.80	1.78	38.35	31.05	33.33	13.33	11.00	100.00	11.16	30.30	20.61
130-139	0.00	31.28	29.21	0.00	25.10	19.63	27.78	6.67	11.65	0.00	2.15	21.21	17.10
140-149	0.00	23.59	24.26	0.00	3.21	6.39	0.00	6.67	17.80	0.00	0.86	0.00	10.30
150-159	5.00	5.64	5.45	0.00	0.80	1.37	0.00	0.00	11.00	0.00	0.43	0.00	3.92
160-169	0.00	0.00	0.50	0.00	0.00	0.46	0.00	0.00	3.88	0.00	0.00	0.00	0.94
170-179	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**

Table 7. (cont) Limnothrissa miodon catch composition. Total numbers in samples and % distributions (gears combined) in various sampling areas in July 1993-June 1994.

Kipili

Length group (mm)	Jul.93 N	Aug.93 N	Sep.93 N	Oct.93 N	Nov.93 N	Dec.93 N	Jan.94 N	Feb.94 N	Mar.94 N	Apr.94 N	May.94 N	Jun.94 N	Total N
10-19		0	0		0	0	0		0	0	0	0	0
20-29		0	0		0	0	0		0	0	0	0	0
30-39		20	10		0	0	0		36	8	138	139	351
40-49		98	48		0	1	2		76	138	34	59	456
50-59		306	307		0	1	26		143	854	163	41	1841
60-69		243	277		0	3	19		213	1225	966	192	3138
70-79		80	91		0	6	13		278	1130	740	1525	3863
80-89		55	76		0	142	38		468	1318	279	2395	4771
90-99		32	27		1	239	119		713	1020	112	580	2843
100-109		75	78		19	92	96		303	489	58	58	1268
110-119		26	38		15	33	17		22	116	37	14	318
120-129		5	6		10	8	10		7	11	17	0	74
130-139		2	5		8	4	1		2	0	6	0	28
140-149		1	0		0	0	1		0	1	3	0	6
150-159		0	1		0	0	0		0	0	6	0	7
160-169		0	0		0	0	0		0	0	0	0	0
170-179		0	0		0	0	0		0	0	0	0	0
Total		943	964		53	529	342		2261	6310	2559	5003	18964

Length group (mm)	Jul.93 %	Aug.93 %	Sep.93 %	Oct.93 %	Nov.93 %	Dec.93 %	Jan.94 %	Feb.94 %	Mar.94 %	Apr.94 %	May.94 %	Jun.94 %	Total %
10-19		0.00	0.00		0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00
20-29		0.00	0.00		0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00
30-39		2.12	1.04		0.00	0.00	0.00		1.59	0.13	5.39	2.78	1.85
40-49		10.39	4.98		0.00	0.19	0.58		3.36	2.19	1.33	1.18	2.40
50-59		32.45	31.85		0.00	0.19	7.60		6.32	13.53	6.37	0.82	9.71
60-69		25.77	28.73		0.00	0.57	5.56		9.42	19.41	37.75	3.84	16.55
70-79		8.48	9.44		0.00	1.13	3.80		12.30	17.91	28.92	30.48	20.37
80-89		5.83	7.88		0.00	26.84	11.11		20.70	20.89	10.90	47.87	25.16
90-99		3.39	2.80		1.89	45.18	34.80		31.53	16.16	4.38	11.59	14.99
100-109		7.95	8.09		35.85	17.39	28.07		13.40	7.75	2.27	1.16	6.69
110-119		2.76	3.94		28.30	6.24	4.97		0.97	1.84	1.45	0.28	1.68
120-129		0.53	0.62		18.87	1.51	2.92		0.31	0.17	0.66	0.00	0.39
130-139		0.21	0.52		15.09	0.76	0.29		0.09	0.00	0.23	0.00	0.15
140-149		0.11	0.00		0.00	0.00	0.29		0.00	0.02	0.12	0.00	0.03
150-159		0.00	0.10		0.00	0.00	0.00		0.00	0.00	0.23	0.00	0.04
160-169		0.00	0.00		0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00
170-179		0.00	0.00		0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00
Total		100	100		100	100	100		100	100	100	100	100

Table 7. (cont) Limnothrissa miodon catch composition. Total numbers in samples and % distributions (gears combined) in various sampling areas in July 1993-June 1994.

Mpulungu

Length group (mm)	Jul.93 N	Aug.93 N	Sep.93 N	Oct.93 N	Nov.93 N	Dec.93 N	Jan.94 N	Feb.94 N	Mar.94 N	Apr.94 N	May.94 N	Jun.94 N	Total N
10-19	16	293	0	0	0	0	0	0	0	151	211	209	880
20-29	428	592	184	71	257	843	0	49	50	1347	2442	1905	8168
30-39	526	24	586	476	343	473	48	85	79	277	885	760	4562
40-49	1009	8	618	78	52	31	29	208	66	373	163	53	2688
50-59	96	4	1144	138	6	11	3	225	91	652	10	24	2404
60-69	11	2	1324	322	0	351	30	156	95	30	1	56	2378
70-79	40	26	145	49	0	1086	153	360	188	19	0	89	2155
80-89	44	99	19	1	0	306	113	323	387	77	0	42	1411
90-99	56	21	2	1	0	76	36	120	532	39	0	15	898
100-109	47	23	0	5	0	0	8	3	150	15	0	24	275
110-119	26	13	0	43	0	0	25	1	7	1	1	25	142
120-129	7	5	0	144	0	0	187	1	58	1	8	33	444
130-139	0	3	0	89	0	1	187	39	147	0	41	19	526
140-149	0	0	0	7	0	0	61	48	73	0	31	6	226
150-159	0	1	0	2	0	1	3	11	16	0	10	12	56
160-169	0	0	0	1	0	0	0	2	4	0	2	1	10
170-179	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	2306	1114	4022	1427	658	3179	883	1631	1943	2982	3805	3273	27223

Length group (mm)	Jul.93 %	Aug.93 %	Sep.93 %	Oct.93 %	Nov.93 %	Dec.93 %	Jan.94 %	Feb.94 %	Mar.94 %	Apr.94 %	May.94 %	Jun.94 %	Total %
10-19	0.69	26.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.06	5.55	6.39	3.23
20-29	18.56	53.14	4.57	4.98	39.06	26.52	0.00	3.00	2.57	45.17	64.18	58.20	30.00
30-39	22.81	2.15	14.57	33.36	52.13	14.88	5.44	5.21	4.07	9.29	23.26	23.22	16.76
40-49	43.76	0.72	15.37	5.47	7.90	0.98	3.28	12.75	3.40	12.51	4.28	1.62	9.87
50-59	4.16	0.36	28.44	9.67	0.91	0.35	0.34	13.80	4.68	21.86	0.26	0.73	8.83
60-69	0.48	0.18	32.92	22.56	0.00	11.04	3.40	9.56	4.89	1.01	0.03	1.71	8.74
70-79	1.73	2.33	3.61	3.43	0.00	34.16	17.33	22.07	9.68	0.64	0.00	2.72	7.92
80-89	1.91	8.89	0.47	0.07	0.00	9.63	12.80	19.80	19.92	2.58	0.00	1.28	5.18
90-99	2.43	1.89	0.05	0.07	0.00	2.39	4.08	7.36	27.38	1.31	0.00	0.46	3.30
100-109	2.04	2.06	0.00	0.35	0.00	0.00	0.91	0.18	7.72	0.50	0.00	0.73	1.01
110-119	1.13	1.17	0.00	3.01	0.00	0.00	2.83	0.06	0.36	0.03	0.03	0.76	0.52
120-129	0.30	0.45	0.00	10.09	0.00	0.00	21.18	0.06	2.99	0.03	0.21	1.01	1.63
130-139	0.00	0.27	0.00	6.24	0.00	0.03	21.18	2.39	7.57	0.00	1.08	0.58	1.93
140-149	0.00	0.00	0.00	0.49	0.00	0.00	6.91	2.94	3.76	0.00	0.81	0.18	0.83
150-159	0.00	0.09	0.00	0.14	0.00	0.03	0.34	0.67	0.82	0.00	0.26	0.37	0.21
160-169	0.00	0.00	0.00	0.07	0.00	0.00	0.00	0.12	0.21	0.00	0.05	0.03	0.04
170-179	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	100	100	100	100	100	100	100	100	100	100	100	100	100

Table 8. Stolothrissa tanganicae catch composition. Total numbers in samples and % distributions (gears combined) in various sampling areas in July 1993-June 1994.

Bujumbura

Length group (mm)	Jul.93 N	Aug.93 N	Sep.93 N	Oct.93 N	Nov.93 N	Dec.93 N	Jan.94 N	Feb.94 N	Mar.94 N	Apr.94 N	May.94 N	Jun.94 N	Total N
10-19	0	0	0	0	0	0	0	0	0	0	0	0	0
20-29	0	21	765	0	0	0	0	0	1	130	0	0	917
30-39	0	3309	1230	0	3	0	180	0	81	1378	0	0	6181
40-49	3	5925	4427	0	29	2	4537	1	202	7704	748	2	23580
50-59	671	128	1736	0	321	189	2678	147	38	5294	6196	165	17563
60-69	1009	2	74	2	242	618	105	4699	105	1680	7186	2520	18242
70-79	180	0	2	100	45	831	297	880	1220	234	2067	3264	9120
80-89	31	0	0	134	239	490	542	580	1255	48	117	612	4048
90-99	5	1	0	39	95	40	44	86	197	7	24	46	584
100-109	0	0	0	2	12	0	0	0	5	3	4	1	27
110-119	0	0	0	0	0	0	0	0	0	0	0	0	0
120-129	0	0	0	0	0	0	0	0	0	0	0	0	0
130-139	0	0	0	0	0	0	0	0	0	0	0	0	0
140-149	0	0	0	0	0	0	0	0	0	0	0	0	0
150-159	0	0	0	0	0	0	0	0	0	0	0	0	0
160-169	0	0	0	0	0	0	0	0	0	0	0	0	0
170-179	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	1899	9386	8234	277	986	2170	8383	6393	3104	16478	16342	6610	80262

Length group (mm)	Jul.93 %	Aug.93 %	Sep.93 %	Oct.93 %	Nov.93 %	Dec.93 %	Jan.94 %	Feb.94 %	Mar.94 %	Apr.94 %	May.94 %	Jun.94 %	Total %
10-19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20-29	0.00	0.22	9.29	0.00	0.00	0.00	0.00	0.00	0.03	0.79	0.00	0.00	1.14
30-39	0.00	35.25	14.94	0.00	0.30	0.00	2.15	0.00	2.61	8.36	0.00	0.00	7.70
40-49	0.16	63.13	53.76	0.00	2.94	0.09	54.12	0.02	6.51	46.75	4.58	0.03	29.38
50-59	35.33	1.36	21.08	0.00	32.56	8.71	31.95	2.30	1.22	32.13	37.91	2.50	21.88
60-69	53.13	0.02	0.90	0.72	24.54	28.48	1.25	73.50	3.38	10.20	43.97	38.12	22.73
70-79	9.48	0.00	0.02	36.10	4.56	38.29	3.54	13.77	39.30	1.42	12.65	49.38	11.36
80-89	1.63	0.00	0.00	48.38	24.24	22.58	6.47	9.07	40.43	0.29	0.72	9.26	5.04
90-99	0.26	0.01	0.00	14.08	9.63	1.84	0.52	1.35	6.35	0.04	0.15	0.70	0.73
100-109	0.00	0.00	0.00	0.72	1.22	0.00	0.00	0.00	0.16	0.02	0.02	0.02	0.03
110-119	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
120-129	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
130-139	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
140-149	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
150-159	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160-169	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
170-179	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	100	100	100	100	100	100	100	100	100	100	100	100	100

Table 8 (cont) **Stolothrissa tanganicae catch composition. Total numbers in samples and % distributions (gears combined) in various sampling areas in July 1993-June 1994.**

Uvira

Length group (mm)	Jul.93 N	Aug.93 N	Sep.93 N	Oct.93 N	Nov.93 N	Dec.93 N	Jan.94 N	Feb.94 N	Mar.94 N	Apr.94 N	May.94 N	Jun.94 N	Total N
10-19		0	0	0	0	0	0	0	0		0	0	0
20-29		25	0	0	0	0	0	0	0		0	0	25
30-39		635	0	0	0	0	0	0	46		0	0	681
40-49		2395	0	0	0	0	12	0	428		7	0	2842
50-59		826	7	25	1	1	51	188	291		632	8	2030
60-69		40	4	165	3	4	3	784	48		1557	549	3157
70-79		3	3	45	65	57	77	324	32		1960	1015	3581
80-89		1	1	28	260	143	90	193	63		360	399	1538
90-99		0	1	6	141	127	24	102	88		88	41	618
100-109		0	0	1	11	10	3	7	37		14	7	90
110-119		0	0	0	1	0	0	0	0		0	1	2
120-129		0	0	0	0	0	0	0	0		0	0	0
130-139		0	0	0	0	0	0	0	0		0	0	0
140-149		0	0	0	0	0	0	0	0		0	0	0
150-159		0	0	0	0	0	0	0	0		0	0	0
160-169		0	0	0	0	0	0	0	0		0	0	0
170-179		0	0	0	0	0	0	0	0		0	0	0
Total		**3925**	**16**	**270**	**482**	**342**	**260**	**1598**	**1033**		**4618**	**2020**	**14564**

Length group (mm)	Jul.93 %	Aug.93 %	Sep.93 %	Oct.93 %	Nov.93 %	Dec.93 %	Jan.94 %	Feb.94 %	Mar.94 %	Apr.94 %	May.94 %	Jun.94 %	Total %
10-19		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00
20-29		0.64	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.17
30-39		16.18	0.00	0.00	0.00	0.00	0.00	0.00	4.45		0.00	0.00	4.68
40-49		61.02	0.00	0.00	0.00	0.00	4.62	0.00	41.43		0.15	0.00	19.51
50-59		21.04	43.75	9.26	0.21	0.29	19.62	11.76	28.17		13.69	0.40	13.94
60-69		1.02	25.00	61.11	0.62	1.17	1.15	49.06	4.65		33.72	27.18	21.68
70-79		0.08	18.75	16.67	13.49	16.67	29.62	20.28	3.10		42.44	50.25	24.59
80-89		0.03	6.25	10.37	53.94	41.81	34.62	12.08	6.10		7.80	19.75	10.56
90-99		0.00	6.25	2.22	29.25	37.13	9.23	6.38	8.52		1.91	2.03	4.24
100-109		0.00	0.00	0.37	2.28	2.92	1.15	0.44	3.58		0.30	0.35	0.62
110-119		0.00	0.00	0.00	0.21	0.00	0.00	0.00	0.00		0.00	0.05	0.01
120-129		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00
130-139		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00
140-149		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00
150-159		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00
160-169		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00
170-179		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Total		**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**		**100**	**100**	**100**

Table 8 (cont) Stolothrissa tanganicae catch composition. Total numbers in samples and % distributions (gears combined) in various sampling areas in July 1993-June 1994.

Kalemie

Length group (mm)	Jul.93 N	Aug.93 N	Sep.93 N	Oct.93 N	Nov.93 N	Dec.93 N	Jan.94 N	Feb.94 N	Mar.94 N	Apr.94 N	May.94 N	Jun.94 N	Total N
10-19						0	0	0		0	0		0
20-29						0	0	0		57	1		58
30-39						0	0	0		667	217		884
40-49						1	0	2		1062	1731		2796
50-59						6	0	5		537	2582		3130
60-69						59	103	459		540	3515		4676
70-79						160	455	768		252	6130		7765
80-89						94	887	551		15	5304		6851
90-99						20	173	4		0	2128		2325
100-109						0	0	0		0	245		245
110-119						0	0	0		0	0		0
120-129						0	0	0		0	0		0
130-139						0	0	0		0	0		0
140-149						0	0	0		0	0		0
150-159						0	0	0		0	0		0
160-169						0	0	0		0	0		0
170-179						0	0	0		0	0		0
Total						340	1618	1789		3130	21853		28730

Length group (mm)	Jul.93 %	Aug.93 %	Sep.93 %	Oct.93 %	Nov.93 %	Dec.93 %	Jan.94 %	Feb.94 %	Mar.94 %	Apr.94 %	May.94 %	Jun.94 %	Total %
10-19						0.00	0.00	0.00		0.00	0.00		0.00
20-29						0.00	0.00	0.00		1.82	0.00		0.20
30-39						0.00	0.00	0.00		21.31	0.99		3.08
40-49						0.29	0.00	0.11		33.93	7.92		9.73
50-59						1.76	0.00	0.28		17.16	11.82		10.89
60-69						17.35	6.37	25.66		17.25	16.08		16.28
70-79						47.06	28.12	42.93		8.05	28.05		27.03
80-89						27.65	54.82	30.80		0.48	24.27		23.85
90-99						5.88	10.69	0.22		0.00	9.74		8.09
100-109						0.00	0.00	0.00		0.00	1.12		0.85
110-119						0.00	0.00	0.00		0.00	0.00		0.00
120-129						0.00	0.00	0.00		0.00	0.00		0.00
130-139						0.00	0.00	0.00		0.00	0.00		0.00
140-149						0.00	0.00	0.00		0.00	0.00		0.00
150-159						0.00	0.00	0.00		0.00	0.00		0.00
160-169						0.00	0.00	0.00		0.00	0.00		0.00
170-179						0.00	0.00	0.00		0.00	0.00		0.00
Total						100	100	100		100	100		100

Table 8 (cont) Stolothrissa tanganicae catch composition. Total numbers in samples and % distributions (gears combined) in various sampling areas in July 1993-June 1994.

Kigoma

Length group (mm)	Jul.93 N	Aug.93 N	Sep.93 N	Oct.93 N	Nov.93 N	Dec.93 N	Jan.94 N	Feb.94 N	Mar.94 N	Apr.94 N	May.94 N	Jun.94 N	Total N
10-19	0	0	0	0	0	0	0	0	0	0	0	0	0
20-29	0	1	0	3	0	0	0	0	0	0	0	0	3
30-39	0	34	4	1	0	0	11	0	154	0	0	0	181
40-49	50	118	220	114	44	0	76	5	333	1	351	0	1085
50-59	535	722	490	92	599	70	45	44	30	13	1066	37	3104
60-69	627	1651	1300	349	589	492	242	160	41	100	1104	650	6524
70-79	1636	2348	2398	1013	788	1247	1602	444	71	59	950	934	12263
80-89	1388	930	1074	583	1548	2158	1554	985	107	316	376	488	13940
90-99	23	123	37	13	619	373	284	121	72	59	46	148	2375
100-109	0	2	0	0	11	3	10	3	1	1	2	24	65
110-119	0	0	0	0	0	0	0	0	0	0	0	0	0
120-129	0	0	0	0	0	0	0	0	0	0	0	0	0
130-139	0	0	0	0	0	0	0	0	0	0	0	0	0
140-149	0	0	0	0	0	0	0	0	0	0	0	0	0
150-159	0	0	0	0	0	0	0	0	0	0	0	0	0
160-169	0	0	0	0	0	0	0	0	0	0	0	0	0
170-179	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	4259	5929	5523	2168	4198	4343	3824	1762	809	549	3895	2281	39540

Length group (mm)	Jul.93 %	Aug.93 %	Sep.93 %	Oct.93 %	Nov.93 %	Dec.93 %	Jan.94 %	Feb.94 %	Mar.94 %	Apr.94 %	May.94 %	Jun.94 %	Total %
10-19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20-29	0.00	0.02	0.00	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
30-39	0.00	0.57	0.07	0.05	0.00	0.00	0.29	0.00	19.04	0.00	0.00	0.00	0.46
40-49	1.17	1.99	3.98	5.26	1.05	0.00	1.99	0.28	41.16	0.18	9.01	0.00	2.74
50-59	12.56	12.18	8.87	4.24	14.27	1.61	1.18	2.50	3.71	2.37	27.37	1.62	7.85
60-69	14.72	27.85	23.54	16.10	14.03	11.33	6.33	9.08	5.07	18.21	28.34	28.50	16.50
70-79	38.41	39.60	43.42	46.73	18.77	28.71	41.89	25.20	8.78	10.75	24.39	40.95	31.01
80-89	32.59	15.69	19.45	26.89	36.87	49.69	40.64	55.90	13.23	57.56	9.65	21.39	35.26
90-99	0.54	2.07	0.67	0.60	14.75	8.59	7.43	6.87	8.90	10.75	1.18	6.49	6.01
100-109	0.00	0.03	0.00	0.00	0.26	0.07	0.26	0.17	0.12	0.18	0.05	1.05	0.16
110-119	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
120-129	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
130-139	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
140-149	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
150-159	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160-169	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
170-179	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	100	100	100	100	100	100	100	100	100	100	100	100	100

Table 8 (cont) Stolothrissa tanganicae catch composition. Total numbers in samples and % distributions (gears combined) in various sampling areas in July 1993-June 1994.

Kipili

Length group (mm)	Jul.93 N	Aug.93 N	Sep.93 N	Oct.93 N	Nov.93 N	Dec.93 N	Jan.94 N	Feb.94 N	Mar.94 N	Apr.94 N	May.94 N	Jun.94 N	Total N
10-19		0	0		0	0	0				0		0
20-29		0	0		0	0	0				0		0
30-39		11	3		0	0	0				0		4
40-49		137	37		0	0	0				1		106
50-59		154	98		0	0	0				23		219
60-69		80	71		24	13	0				60		340
70-79		45	43		124	13	0				28		258
80-89		28	24		101	13	0				1		196
90-99		0	0		117	5	0				0		131
100-109		0	0		39	0	1				0		40
110-119		0	0		3	0	0				0		3
120-129		0	0		0	0	0				0		0
130-139		0	0		0	0	0				0		0
140-149		0	0		0	0	0				0		0
150-159		0	0		0	0	0				0		0
160-169		0	0		0	0	0				0		0
170-179		0	0		0	0	0				0		0
Total		455	276		408	44	1				113		1297

Length group (mm)	Jul.93 %	Aug.93 %	Sep.93 %	Oct.93 %	Nov.93 %	Dec.93 %	Jan.94 %	Feb.94 %	Mar.94 %	Apr.94 %	May.94 %	Jun.94 %	Total %
10-19		0.00	0.00		0.00	0.00	0.00				0.00		0.00
20-29		0.00	0.00		0.00	0.00	0.00				0.00		0.00
30-39		2.42	1.09		0.00	0.00	0.00				0.00		0.31
40-49		30.11	13.41		0.00	0.00	0.00				0.88		8.17
50-59		33.85	35.51		0.00	0.00	0.00				20.35		16.89
60-69		17.58	25.72		5.88	29.55	0.00				53.10		26.21
70-79		9.89	15.58		30.39	29.55	0.00				24.78		19.89
80-89		6.15	8.70		24.75	29.55	0.00				0.88		15.11
90-99		0.00	0.00		28.68	11.36	0.00				0.00		10.10
100-109		0.00	0.00		9.56	0.00	100.00				0.00		3.08
110-119		0.00	0.00		0.74	0.00	0.00				0.00		0.23
120-129		0.00	0.00		0.00	0.00	0.00				0.00		0.00
130-139		0.00	0.00		0.00	0.00	0.00				0.00		0.00
140-149		0.00	0.00		0.00	0.00	0.00				0.00		0.00
150-159		0.00	0.00		0.00	0.00	0.00				0.00		0.00
160-169		0.00	0.00		0.00	0.00	0.00				0.00		0.00
170-179		0.00	0.00		0.00	0.00	0.00				0.00		0.00
Total		100	100		100	100	100				100		100

Table 8 (cont) Stolothrissa tanganicae catch composition. Total numbers in samples and % distributions (gears combined) in various sampling areas in July 1993-June 1994.

Mpulungu

Length group (mm)	Jul.93 N	Aug.93 N	Sep.93 N	Oct.93 N	Nov.93 N	Dec.93 N	Jan.94 N	Feb.94 N	Mar.94 N	Apr.94 N	May.94 N	Jun.94 N	Total N
10-19	0	0	11	5	0	0	0	0	0		0	0	16
20-29	6	0	224	440	0	0	0	0	0		0	0	670
30-39	4	0	594	391	0	0	0	0	0		0	0	989
40-49	124	0	1741	38	8	0	0	1	0		0	0	1912
50-59	747	0	173	1	2	1	0	1	0		0	0	925
60-69	403	7	25	0	0	13	2	10	1		0	0	461
70-79	75	208	10	11	0	255	5	71	1		0	2	638
80-89	82	85	3	61	0	87	66	92	5		0	86	567
90-99	50	90	0	50	0	66	206	4	22		3	21	512
100-109	15	21	0	5	0	12	505	53	46		10	8	675
110-119	0	0	0	0	0	0	58	4	3		2	5	72
120-129	0	0	0	0	0	0	0	0	0		0	0	0
130-139	0	0	0	0	0	0	0	0	0		0	0	0
140-149	0	0	0	0	0	0	0	0	0		0	0	0
150-159	0	0	0	0	0	0	0	0	0		0	0	0
160-169	0	0	0	0	0	0	0	0	0		0	0	0
170-179	0	0	0	0	0	0	0	0	0		0	0	0
Total	1506	411	2781	1002	10	434	842	236	78		15	122	7437

Length group (mm)	Jul.93 %	Aug.93 %	Sep.93 %	Oct.93 %	Nov.93 %	Dec.93 %	Jan.94 %	Feb.94 %	Mar.94 %	Apr.94 %	May.94 %	Jun.94 %	Total %
10-19	0.00	0.00	0.40	0.50	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.22
20-29	0.40	0.00	8.05	43.91	0.00	0.00	0.00	0.00	0.00		0.00	0.00	9.01
30-39	0.27	0.00	21.36	39.02	0.00	0.00	0.00	0.00	0.00		0.00	0.00	13.30
40-49	8.23	0.00	62.60	3.79	80.00	0.00	0.00	0.42	0.00		0.00	0.00	25.71
50-59	49.60	0.00	6.22	0.10	20.00	0.23	0.00	0.42	0.00		0.00	0.00	12.44
60-69	26.76	1.70	0.90	0.00	0.00	3.00	0.24	4.24	1.28		0.00	0.00	6.20
70-79	4.98	50.61	0.36	1.10	0.00	58.76	0.59	30.08	1.28		0.00	1.64	8.58
80-89	5.44	20.68	0.11	6.09	0.00	20.05	7.84	38.98	6.41		0.00	70.49	7.62
90-99	3.32	21.90	0.00	4.99	0.00	15.21	24.47	1.69	28.21		20.00	17.21	6.88
100-109	1.00	5.11	0.00	0.50	0.00	2.76	59.98	22.46	58.97		66.67	6.56	9.08
110-119	0.00	0.00	0.00	0.00	0.00	0.00	6.89	1.69	3.85		13.33	4.10	0.97
120-129	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00
130-139	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00
140-149	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00
150-159	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00
160-169	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00
170-179	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Total	100	100	100	100	100	100	100	100	100		100	100	100

Table 9. Lates stappersi catch composition. Total numbers in samples and % distributions (gears combined) in various sampling areas in July 1993-June 1994.

Bujumbura

Length group (mm)	Jul.93 N	Aug.93 N	Sep.93 N	Oct.93 N	Nov.93 N	Dec.93 N	Jan.94 N	Feb.94 N	Mar.94 N	Apr.94 N	May.94 N	Jun.94 N	Total N
10-29	0		0	1	0	0	0	0	0	0	0	0	1
30-49	0		0	0	0	7	17	12	26	0	0	0	62
50-69	3		0	338	0	0	82	1	30	1	0	0	455
70-89	140		0	360	5	3	16	24	20	0	16	19	603
90-109	447		0	20	274	19	0	7	5	42	14	223	1051
110-129	83		0	59	22	4	0	2	0	46	0	40	256
130-149	1		0	8	13	0	0	1	0	9	0	3	35
150-169	0		0	1	3	0	0	0	0	0	0	0	4
170-189	0		0	7	0	0	0	0	1	0	0	0	8
190-209	0		0	1	0	0	0	0	3	0	0	0	4
210-229	0		0	0	0	0	0	0	11	0	0	1	12
230-249	0		0	0	0	0	0	0	16	0	0	1	17
250-269	0		0	0	0	0	0	0	3	0	0	2	5
270-289	0		0	0	0	1	0	0	4	0	0	2	7
290-309	0		0	0	0	0	0	0	1	0	0	18	19
310-329	0		0	0	0	1	0	0	8	0	0	22	31
330-349	0		3	0	0	4	0	0	2	0	0	14	23
350-369	0		1	0	0	5	0	0	1	0	0	4	11
370-389	0		0	0	0	1	0	0	0	0	0	0	1
390-409	0		1	0	0	0	0	0	0	0	0	0	1
410-429	0		0	0	0	0	0	0	0	0	0	0	0
430-449	0		0	0	0	0	0	0	0	0	0	0	0
450-469	0		0	0	0	0	0	0	0	0	0	0	0
470-489	0		0	0	0	0	0	0	0	0	0	0	0
490-509	0		0	0	0	0	0	0	0	0	0	0	0
510-529	0		0	0	0	0	0	0	0	0	0	0	0
530-549	0		0	0	0	0	0	0	0	0	0	0	0
550-569	0		0	0	0	0	0	0	0	0	0	0	0
570-589	0		0	0	0	0	0	0	0	0	0	0	0
>590	0		0	0	0	0	0	0	0	0	0	0	0
Total	**674**		**5**	**795**	**317**	**45**	**115**	**47**	**131**	**98**	**30**	**349**	**2606**

Length group (mm)	Jul.93 %	Aug.93 %	Sep.93 %	Oct.93 %	Nov.93 %	Dec.93 %	Jan.94 %	Feb.94 %	Mar.94 %	Apr.94 %	May.94 %	Jun.94 %	Total %
10-29	0.00		0.00	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04
30-49	0.00		0.00	0.00	0.00	15.56	14.78	25.53	19.85	0.00	0.00	0.00	2.38
50-69	0.45		0.00	42.52	0.00	0.00	71.30	2.13	22.90	1.02	0.00	0.00	17.46
70-89	20.77		0.00	45.28	1.58	6.67	13.91	51.06	15.27	0.00	53.33	5.44	23.14
90-109	66.32		0.00	2.52	86.44	42.22	0.00	14.89	3.82	42.86	46.67	63.90	40.33
110-129	12.31		0.00	7.42	6.94	8.89	0.00	4.26	0.00	46.94	0.00	11.46	9.82
130-149	0.15		0.00	1.01	4.10	0.00	0.00	2.13	0.00	9.18	0.00	0.86	1.34
150-169	0.00		0.00	0.13	0.95	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15
170-189	0.00		0.00	0.88	0.00	0.00	0.00	0.00	0.76	0.00	0.00	0.00	0.31
190-209	0.00		0.00	0.13	0.00	0.00	0.00	0.00	2.29	0.00	0.00	0.00	0.15
210-229	0.00		0.00	0.00	0.00	0.00	0.00	0.00	8.40	0.00	0.00	0.29	0.46
230-249	0.00		0.00	0.00	0.00	0.00	0.00	0.00	12.21	0.00	0.00	0.29	0.65
250-269	0.00		0.00	0.00	0.00	0.00	0.00	0.00	2.29	0.00	0.00	0.57	0.19
270-289	0.00		0.00	0.00	0.00	2.22	0.00	0.00	3.05	0.00	0.00	0.57	0.27
290-309	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.76	0.00	0.00	5.16	0.73
310-329	0.00		0.00	0.00	0.00	2.22	0.00	0.00	6.11	0.00	0.00	6.30	1.19
330-349	0.00		60.00	0.00	0.00	8.89	0.00	0.00	1.53	0.00	0.00	4.01	0.88
350-369	0.00		20.00	0.00	0.00	11.11	0.00	0.00	0.76	0.00	0.00	1.15	0.42
370-389	0.00		0.00	0.00	0.00	2.22	0.00	0.00	0.00	0.00	0.00	0.00	0.04
390-409	0.00		20.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04
410-429	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
430-449	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
450-469	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
470-489	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
490-509	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
510-529	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
530-549	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
550-569	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
570-589	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
>590	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**100**		**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**

Table 9. (cont) Lates stappersi catch composition. Total numbers in samples and % distributions (gears combined) in various sampling areas in July 1993-June 1994.

Uvira

Length group (mm)	Jul.93 N	Aug.93 N	Sep.93 N	Oct.93 N	Nov.93 N	Dec.93 N	Jan.94 N	Feb.94 N	Mar.94 N	Apr.94 N	May.94 N	Jun.94 N	Total N
10-29		0	0	0	0	0	0	0	0		0	0	0
30-49		15	0	6	0	1	0	0	0		5	24	51
50-69		32	2	13	4	12	4	0	13		137	4	221
70-89		3	80	15	6	7	7	19	183		524	17	861
90-109		3	21	4	208	10	37	29	146		212	78	748
110-129		2	2	0	43	34	112	32	104		7	3	339
130-149		0	0	0	5	0	0	1	13		0	0	19
150-169		0	0	0	1	0	0	0	1		0	0	2
170-189		0	0	0	0	0	0	0	0		0	0	0
190-209		0	0	0	0	0	0	0	0		0	0	0
210-229		0	0	0	0	1	0	0	0		0	0	1
230-249		0	0	0	0	0	0	0	0		0	0	0
250-269		0	0	0	0	0	0	0	0		0	0	0
270-289		0	0	0	0	0	0	0	0		0	0	0
290-309		0	0	0	0	0	0	0	0		0	0	0
310-329		0	0	0	0	1	0	0	1		0	0	2
330-349		0	0	0	0	0	0	0	2		0	0	2
350-369		0	0	0	0	0	0	0	2		0	0	2
370-389		0	0	0	0	0	0	0	0		0	0	0
390-409		0	0	0	0	0	0	0	0		0	0	0
410-429		0	0	0	0	0	0	0	0		0	0	0
430-449		0	0	0	0	0	0	0	0		0	0	0
450-469		0	0	0	0	0	0	0	0		0	0	0
470-489		0	0	0	0	0	0	0	0		0	0	0
490-509		0	0	0	0	0	0	0	0		0	0	0
510-529		0	0	0	0	0	0	0	0		0	0	0
530-549		0	0	0	0	0	0	0	0		0	0	0
550-569		0	0	0	0	0	0	0	0		0	0	0
570-589		0	0	0	0	0	0	0	0		0	0	0
>590		0	0	0	0	0	0	0	0		0	0	0
Total		55	105	38	267	66	160	81	465		885	126	2248

Length group (mm)	Jul.93 %	Aug.93 %	Sep.93 %	Oct.93 %	Nov.93 %	Dec.93 %	Jan.94 %	Feb.94 %	Mar.94 %	Apr.94 %	May.94 %	Jun.94 %	Total %
10-29		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00
30-49		27.27	0.00	15.79	0.00	1.52	0.00	0.00	0.00		0.56	19.05	2.27
50-69		58.18	1.90	34.21	1.50	18.18	2.50	0.00	2.80		15.48	3.17	9.83
70-89		5.45	76.19	39.47	2.25	10.61	4.38	23.46	39.35		59.21	13.49	38.30
90-109		5.45	20.00	10.53	77.90	15.15	23.13	35.80	31.40		23.95	61.90	33.27
110-129		3.64	1.90	0.00	16.10	51.52	70.00	39.51	22.37		0.79	2.38	15.08
130-149		0.00	0.00	0.00	1.87	0.00	0.00	1.23	2.80		0.00	0.00	0.85
150-169		0.00	0.00	0.00	0.37	0.00	0.00	0.00	0.22		0.00	0.00	0.09
170-189		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00
190-209		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00
210-229		0.00	0.00	0.00	0.00	1.52	0.00	0.00	0.00		0.00	0.00	0.04
230-249		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00
250-269		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00
270-289		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00
290-309		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00
310-329		0.00	0.00	0.00	0.00	1.52	0.00	0.00	0.22		0.00	0.00	0.09
330-349		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.43		0.00	0.00	0.09
350-369		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.43		0.00	0.00	0.09
370-389		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00
390-409		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00
410-429		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00
430-449		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00
450-469		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00
470-489		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00
490-509		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00
510-529		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00
530-549		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00
550-569		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00
570-589		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00
>590		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00
Total		100	100	100	100	100	100	100	100		100	100	100

Table 9. (cont) Lates stappersi catch composition. Total numbers in samples and % distributions (gears combined) in various sampling areas in July 1993-June 1994.

Moba

Length group (mm)	Jul.93 N	Aug.93 N	Sep.93 N	Oct.93 N	Nov.93 N	Dec.93 N	Jan.94 N	Feb.94 N	Mar.94 N	Apr.94 N	May.94 N	Jun.94 N	Total N
10-29										0			0
30-49										0			0
50-69										0			0
70-89										0			0
90-109										0			0
110-129										0			0
130-149										0			0
150-169										0			0
170-189										251			251
190-209										1280			1280
210-229										237			237
230-249										0			0
250-269										0			0
270-289										0			0
290-309										0			0
310-329										0			0
330-349										0			0
350-369										0			0
370-389										0			0
390-409										0			0
410-429										0			0
430-449										0			0
450-469										0			0
470-489										0			0
490-509										0			0
510-529										0			0
530-549										0			0
550-569										0			0
570-589										0			0
>590										0			0
Total										1768			1768

Length group (mm)	Jul.93 %	Aug.93 %	Sep.93 %	Oct.93 %	Nov.93 %	Dec.93 %	Jan.94 %	Feb.94 %	Mar.94 %	Apr.94 %	May.94 %	Jun.94 %	Total %
10-29										0.00			0.00
30-49										0.00			0.00
50-69										0.00			0.00
70-89										0.00			0.00
90-109										0.00			0.00
110-129										0.00			0.00
130-149										0.00			0.00
150-169										0.00			0.00
170-189										14.20			14.20
190-209										72.40			72.40
210-229										13.40			13.40
230-249										0.00			0.00
250-269										0.00			0.00
270-289										0.00			0.00
290-309										0.00			0.00
310-329										0.00			0.00
330-349										0.00			0.00
350-369										0.00			0.00
370-389										0.00			0.00
390-409										0.00			0.00
410-429										0.00			0.00
430-449										0.00			0.00
450-469										0.00			0.00
470-489										0.00			0.00
490-509										0.00			0.00
510-529										0.00			0.00
530-549										0.00			0.00
550-569										0.00			0.00
570-589										0.00			0.00
>590										0.00			0.00
Total										100			100

Table 9. (cont) Lates stappersi catch composition. Total numbers in samples and % distributions (gears combined) in various sampling areas in July 1993-June 1994.

Kigoma

Length group (mm)	Jul.93 N	Aug.93 N	Sep.93 N	Oct.93 N	Nov.93 N	Dec.93 N	Jan.94 N	Feb.94 N	Mar.94 N	Apr.94 N	May.94 N	Jun.94 N	Total N
10-29	0	0	0	0	0	0	0	0	0	0	0	0	0
30-49	0	0	0	0	0	0	0	0	0	0	0	0	0
50-69	0	28	21	0	0	0	2	43	0	0	0	0	94
70-89	8	20	39	60	0	0	15	75	0	3	3	13	236
90-109	12	3	69	132	322	5	4	397	37	44	14	228	1267
110-129	8	18	97	26	67	98	7	45	571	18	464	203	1622
130-149	1	24	18	0	0	5	54	4	189	0	130	197	622
150-169	0	13	5	0	0	0	6	35	86	0	14	9	168
170-189	0	0	0	0	0	0	0	9	143	10	2	0	164
190-209	0	0	0	0	0	0	3	2	16	18	7	0	46
210-229	0	0	0	1	0	0	5	10	3	10	7	0	36
230-249	0	0	0	0	0	0	18	38	10	18	6	0	90
250-269	0	0	0	0	0	0	49	46	34	52	6	5	192
270-289	0	1	0	4	0	0	53	28	39	46	22	19	212
290-309	0	3	0	41	1	3	33	15	64	57	39	27	283
310-329	0	4	1	58	2	2	23	7	44	25	50	42	258
330-349	0	7	8	32	6	7	14	7	27	12	37	62	219
350-369	0	12	2	15	2	0	8	3	6	2	34	21	105
370-389	0	13	1	6	6	2	14	1	4	2	7	12	68
390-409	0	11	3	1	0	1	0	0	0	0	4	4	24
410-429	0	8	0	2	0	0	0	0	0	0	2	0	12
430-449	0	4	1	0	1	0	0	0	0	0	0	2	8
450-469	0	2	0	0	0	1	0	0	0	0	2	3	8
470-489	0	8	0	0	0	0	0	0	0	0	0	0	8
490-509	0	1	0	0	0	0	0	0	0	0	0	0	1
510-529	0	0	0	0	0	0	0	0	0	0	0	0	0
530-549	0	0	0	0	0	0	0	0	0	0	0	0	0
550-569	0	2	0	0	0	0	0	0	0	0	0	0	2
570-589	0	0	0	0	0	0	0	0	0	0	0	0	0
>590	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	**29**	**182**	**265**	**378**	**407**	**124**	**308**	**765**	**1273**	**317**	**850**	**847**	**5745**

Length group (mm)	Jul.93 %	Aug.93 %	Sep.93 %	Oct.93 %	Nov.93 %	Dec.93 %	Jan.94 %	Feb.94 %	Mar.94 %	Apr.94 %	May.94 %	Jun.94 %	Total %
10-29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30-49	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
50-69	0.00	15.38	7.92	0.00	0.00	0.00	0.65	5.62	0.00	0.00	0.00	0.00	1.64
70-89	27.59	10.99	14.72	15.87	0.00	0.00	4.87	9.80	0.00	0.95	0.35	1.53	4.11
90-109	41.38	1.65	26.04	34.92	79.12	4.03	1.30	51.90	2.91	13.88	1.65	26.92	22.05
110-129	27.59	9.89	36.60	6.88	16.46	79.03	2.27	5.88	44.85	5.68	54.59	23.97	28.23
130-149	3.45	13.19	6.79	0.00	0.00	4.03	17.53	0.52	14.85	0.00	15.29	23.26	10.83
150-169	0.00	7.14	1.89	0.00	0.00	0.00	1.95	4.58	6.76	0.00	1.65	1.06	2.92
170-189	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.18	11.23	3.15	0.24	0.00	2.85
190-209	0.00	0.00	0.00	0.00	0.00	0.00	0.97	0.26	1.26	5.68	0.82	0.00	0.80
210-229	0.00	0.00	0.00	0.26	0.00	0.00	1.62	1.31	0.24	3.15	0.82	0.00	0.63
230-249	0.00	0.00	0.00	0.00	0.00	0.00	5.84	4.97	0.79	5.68	0.71	0.00	1.57
250-269	0.00	0.00	0.00	0.00	0.00	0.00	15.91	6.01	2.67	16.40	0.71	0.59	3.34
270-289	0.00	0.55	0.00	1.06	0.00	0.00	17.21	3.66	3.06	14.51	2.59	2.24	3.69
290-309	0.00	1.65	0.00	10.85	0.25	2.42	10.71	1.96	5.03	17.98	4.59	3.19	4.93
310-329	0.00	2.20	0.38	15.34	0.49	1.61	7.47	0.92	3.46	7.89	5.88	4.96	4.49
330-349	0.00	3.85	3.02	8.47	1.47	5.65	4.55	0.92	2.12	3.79	4.35	7.32	3.81
350-369	0.00	6.59	0.75	3.97	0.49	0.00	2.60	0.39	0.47	0.63	4.00	2.48	1.83
370-389	0.00	7.14	0.38	1.59	1.47	1.61	4.55	0.13	0.31	0.63	0.82	1.42	1.18
390-409	0.00	6.04	1.13	0.26	0.00	0.81	0.00	0.00	0.00	0.00	0.47	0.47	0.42
410-429	0.00	4.40	0.00	0.53	0.00	0.00	0.00	0.00	0.00	0.00	0.24	0.00	0.21
430-449	0.00	2.20	0.38	0.00	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.24	0.14
450-469	0.00	1.10	0.00	0.00	0.00	0.81	0.00	0.00	0.00	0.00	0.24	0.35	0.14
470-489	0.00	4.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14
490-509	0.00	0.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
510-529	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
530-549	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
550-569	0.00	1.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03
570-589	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
>590	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**

Table 9. (cont) Lates stappersi catch composition. Total numbers in samples and % distributions (gears combined) in various sampling areas in July 1993-June 1994.

Kipili

Length group (mm)	Jul.93 N	Aug.93 N	Sep.93 N	Oct.93 N	Nov.93 N	Dec.93 N	Jan.94 N	Feb.94 N	Mar.94 N	Apr.94 N	May.94 N	Jun.94 N	Total N
10-29					0	0	0	0	0			0	0
30-49					0	0	0	0	0			0	0
50-69					82	21	0	0	0			1	104
70-89					312	230	0	0	0			5	547
90-109					83	55	0	0	0			3	141
110-129					30	7	0	0	0			0	37
130-149					1	0	0	0	0			0	1
150-169					2	1	0	0	0			8	11
170-189					13	14	0	4	0			17	48
190-209					24	38	4	8	3			27	104
210-229					22	25	10	9	38			27	131
230-249					19	17	12	15	59			33	155
250-269					25	22	28	35	88			35	233
270-289					15	22	26	28	71			60	222
290-309					10	19	28	37	76			54	224
310-329					20	23	26	54	59			48	230
330-349					10	19	25	40	61			38	193
350-369					2	7	19	24	60			18	130
370-389					4	8	40	33	57			4	146
390-409					2	4	8	35	47			6	102
410-429					1	0	3	7	7			3	21
430-449					0	0	2	10	0			1	13
450-469					0	0	1	1	0			0	2
470-489					1	0	0	0	0			0	1
490-509					0	0	0	0	0			0	0
510-529					0	0	0	0	0			0	0
530-549					0	0	0	0	0			0	0
550-569					0	0	0	0	0			0	0
570-589					0	0	0	0	0			0	0
>590					0	0	0	0	0			0	0
Total					678	532	232	340	626			388	2796

Length group (mm)	Jul.93 %	Aug.93 %	Sep.93 %	Oct.93 %	Nov.93 %	Dec.93 %	Jan.94 %	Feb.94 %	Mar.94 %	Apr.94 %	May.94 %	Jun.94 %	Total %
10-29					0.00	0.00	0.00	0.00	0.00			0.00	0.00
30-49					0.00	0.00	0.00	0.00	0.00			0.00	0.00
50-69					12.09	3.95	0.00	0.00	0.00			0.26	3.72
70-89					46.02	43.23	0.00	0.00	0.00			1.29	19.56
90-109					12.24	10.34	0.00	0.00	0.00			0.77	5.04
110-129					4.42	1.32	0.00	0.00	0.00			0.00	1.32
130-149					0.15	0.00	0.00	0.00	0.00			0.00	0.04
150-169					0.29	0.19	0.00	0.00	0.00			2.06	0.39
170-189					1.92	2.63	0.00	1.18	0.00			4.38	1.72
190-209					3.54	7.14	1.72	2.35	0.48			6.96	3.72
210-229					3.24	4.70	4.31	2.65	6.07			6.96	4.69
230-249					2.80	3.20	5.17	4.41	9.42			8.51	5.54
250-269					3.69	4.14	12.07	10.29	14.06			9.02	8.33
270-289					2.21	4.14	11.21	8.24	11.34			15.46	7.94
290-309					1.47	3.57	12.07	10.88	12.14			13.92	8.01
310-329					2.95	4.32	11.21	15.88	9.42			12.37	8.23
330-349					1.47	3.57	10.78	11.76	9.74			9.79	6.90
350-369					0.29	1.32	8.19	7.06	9.58			4.64	4.65
370-389					0.59	1.50	17.24	9.71	9.11			1.03	5.22
390-409					0.29	0.75	3.45	10.29	7.51			1.55	3.65
410-429					0.15	0.00	1.29	2.06	1.12			0.77	0.75
430-449					0.00	0.00	0.86	2.94	0.00			0.26	0.46
450-469					0.00	0.00	0.43	0.29	0.00			0.00	0.07
470-489					0.15	0.00	0.00	0.00	0.00			0.00	0.04
490-509					0.00	0.00	0.00	0.00	0.00			0.00	0.00
510-529					0.00	0.00	0.00	0.00	0.00			0.00	0.00
530-549					0.00	0.00	0.00	0.00	0.00			0.00	0.00
550-569					0.00	0.00	0.00	0.00	0.00			0.00	0.00
570-589					0.00	0.00	0.00	0.00	0.00			0.00	0.00
>590					0.00	0.00	0.00	0.00	0.00			0.00	0.00
Total					100	100	100	100	100			100	100

Table 9. (cont) Lates stappersi catch composition. Total numbers in samples and % distributions (gears combined) in various sampling areas in July 1993-June 1994.

Mpulungu

Length group (mm)	Jul.93 N	Aug.93 N	Sep.93 N	Oct.93 N	Nov.93 N	Dec.93 N	Jan.94 N	Feb.94 N	Mar.94 N	Apr.94 N	May.94 N	Jun.94 N	Total N
10-29	0	0	0	0	0	0	0	0	0	0	0	0	0
30-49	0	0	0	0	0	0	0	0	0	0	0	0	0
50-69	0	0	0	0	0	0	0	0	0	0	0	0	0
70-89	0	0	0	0	0	0	1	1	0	0	0	0	2
90-109	0	0	0	0	0	0	150	52	42	0	1	0	245
110-129	0	0	0	0	0	1	123	36	20	10	1	22	213
130-149	0	0	0	2	0	0	0	0	1	9	4	20	36
150-169	0	0	0	31	4	6	4	1	0	0	0	4	50
170-189	0	0	0	78	32	76	21	3	0	3	0	4	217
190-209	4	5	0	227	124	264	438	102	25	24	0	35	1248
210-229	6	12	0	328	283	171	654	394	315	129	4	123	2419
230-249	14	60	17	303	323	90	487	361	521	348	69	273	2866
250-269	71	254	80	492	529	84	417	303	417	225	186	352	3410
270-289	54	375	153	303	295	147	374	224	287	183	237	223	2855
290-309	20	240	131	127	107	133	136	101	168	83	135	91	1472
310-329	1	88	65	65	34	107	102	87	195	75	77	41	937
330-349	1	23	16	30	11	89	114	118	221	57	64	12	756
350-369	1	15	8	20	30	59	74	75	176	47	46	5	556
370-389	0	10	7	8	50	48	51	75	96	25	40	1	411
390-409	2	14	7	3	36	33	24	63	63	13	15	1	274
410-429	2	2	9	1	27	19	14	15	22	4	2	0	117
430-449	0	3	6	0	6	2	6	4	7	1	2	0	37
450-469	0	0	1	0	0	1	2	0	1	0	0	0	5
470-489	1	0	0	0	0	0	0	1	0	0	1	0	3
490-509	0	0	0	0	0	0	0	0	0	0	0	0	0
510-529	0	0	0	0	0	0	0	0	0	0	0	0	0
530-549	0	0	0	0	0	0	0	0	0	0	0	0	0
550-569	0	0	0	0	0	0	0	0	0	0	0	0	0
570-589	0	0	0	0	0	0	0	0	0	0	0	0	0
>590	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	**177**	**1101**	**500**	**2018**	**1891**	**1330**	**3192**	**2016**	**2577**	**1236**	**884**	**1207**	**18129**

Length group (mm)	Jul.93 %	Aug.93 %	Sep.93 %	Oct.93 %	Nov.93 %	Dec.93 %	Jan.94 %	Feb.94 %	Mar.94 %	Apr.94 %	May.94 %	Jun.94 %	Total %
10-29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30-49	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
50-69	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
70-89	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.05	0.00	0.00	0.00	0.00	0.01
90-109	0.00	0.00	0.00	0.00	0.00	0.00	4.70	2.58	1.63	0.00	0.11	0.00	1.35
110-129	0.00	0.00	0.00	0.00	0.00	0.08	3.85	1.79	0.78	0.81	0.11	1.82	1.17
130-149	0.00	0.00	0.00	0.10	0.00	0.00	0.00	0.00	0.04	0.73	0.45	1.66	0.20
150-169	0.00	0.00	0.00	1.54	0.21	0.45	0.13	0.05	0.00	0.00	0.00	0.33	0.28
170-189	0.00	0.00	0.00	3.87	1.69	5.71	0.66	0.15	0.00	0.24	0.00	0.33	1.20
190-209	2.26	0.45	0.00	11.25	6.56	19.85	13.72	5.06	0.97	1.94	0.00	2.90	6.88
210-229	3.39	1.09	0.00	16.25	14.97	12.86	20.49	19.54	12.22	10.44	0.45	10.19	13.34
230-249	7.91	5.45	3.40	15.01	17.08	6.77	15.26	17.91	20.22	28.16	7.81	22.62	15.81
250-269	40.11	23.07	16.00	24.38	27.97	6.32	13.06	15.03	16.18	18.20	21.04	29.16	18.81
270-289	30.51	34.06	30.60	15.01	15.60	11.05	11.72	11.11	11.14	14.81	26.81	18.48	15.75
290-309	11.30	21.80	26.20	6.29	5.66	10.00	4.26	5.01	6.52	6.72	15.27	7.54	8.12
310-329	0.56	7.99	13.00	3.22	1.80	8.05	3.20	4.32	7.57	6.07	8.71	3.40	5.17
330-349	0.56	2.09	3.20	1.49	0.58	6.69	3.57	5.85	8.58	4.61	7.24	0.99	4.17
350-369	0.56	1.36	1.60	0.99	1.59	4.44	2.32	3.72	6.83	3.80	5.20	0.41	3.07
370-389	0.00	0.91	1.40	0.40	2.64	3.61	1.60	3.72	3.73	2.02	4.52	0.08	2.27
390-409	1.13	1.27	1.40	0.15	1.90	2.48	0.75	3.13	2.44	1.05	1.70	0.08	1.51
410-429	1.13	0.18	1.80	0.05	1.43	1.43	0.44	0.74	0.85	0.32	0.23	0.00	0.65
430-449	0.00	0.27	1.20	0.00	0.32	0.15	0.19	0.20	0.27	0.08	0.23	0.00	0.20
450-469	0.00	0.00	0.20	0.00	0.00	0.08	0.06	0.00	0.04	0.00	0.00	0.00	0.03
470-489	0.56	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.11	0.00	0.02
490-509	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
510-529	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
530-549	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
550-569	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
570-589	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
>590	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**

Table 10. Limnothrissa miodon. Maturity stage data in July 1993-June 1994.
Frequency distributions and % distributions according to maturity stages.
(All gears combined).

Bujumbura

Number of samples: 138

Year total Length group (mm)	Immatures (unident.) 1	Females Maturity stages 2	3	4	5	Total	Males Maturity stages 2	3	4	5	Total	Total number analysed
20-24	2	0	0	0	0	0	0	0	0	0	0	2
25-29	10	0	0	0	0	0	0	0	0	0	0	10
30-34	64	0	0	0	0	0	0	0	0	0	0	64
35-39	87	0	0	0	0	0	0	0	0	0	0	87
40-44	112	0	0	0	0	0	0	0	0	0	0	112
45-49	192	1	0	0	0	1	0	0	0	0	0	193
50-54	306	0	0	0	0	0	0	0	0	0	0	306
55-59	355	2	0	0	0	2	4	0	0	0	4	361
60-64	346	8	0	0	0	8	6	0	0	0	6	360
65-69	349	40	0	0	0	40	40	1	0	1	42	431
70-74	240	108	3	0	2	113	99	7	0	0	106	459
75-79	94	221	17	0	5	243	132	3	0	2	137	474
80-84	32	318	53	2	5	378	107	11	0	0	118	528
85-89	22	315	85	3	10	413	80	21	0	0	101	536
90-94	21	317	114	11	9	451	61	16	2	1	80	552
95-99	16	338	115	10	10	473	44	12	0	0	56	545
100-104	12	240	98	6	4	348	23	7	0	0	30	390
105-109	6	142	51	4	1	198	16	2	0	0	18	222
110-114	4	82	31	2	0	115	6	1	0	0	7	126
115-119	0	50	14	1	0	65	1	1	0	0	2	67
120-124	2	37	12	2	0	51	0	4	0	0	4	57
125-129	0	17	9	3	1	30	2	1	0	0	3	33
130-134	0	6	5	0	0	11	0	1	0	0	1	12
135-139	0	6	5	0	0	11	0	0	0	0	0	11
140-144	0	3	0	0	1	4	0	0	0	0	0	4
145-149	0	1	0	0	0	1	0	0	0	0	0	1
150-154	0	3	0	0	0	3	0	0	0	0	0	3
155-159	0	0	0	0	0	0	0	0	0	0	0	0
160-164	0	0	0	0	0	0	0	0	0	0	0	0
165-169	0	0	0	0	0	0	0	0	0	0	0	0
170-174	0	0	0	0	0	0	0	0	0	0	0	0
175-179	0	0	0	0	0	0	0	0	0	0	0	0
Total	**2272**	**2255**	**612**	**44**	**48**	**2959**	**621**	**88**	**2**	**4**	**715**	**5946**

Length group (mm)	Immatures (unident.) % 1	Females % of various maturity stages 2	3	4	5	Females Total %	Males % of various maturity stages 2	3	4	5	Males Total %	Per cent of the total
20-24	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03
25-29	0.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17
30-34	2.82	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.08
35-39	3.83	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.46
40-44	4.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.88
45-49	8.45	0.03	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	3.25
50-54	13.47	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.15
55-59	15.63	0.07	0.00	0.00	0.00	0.07	0.56	0.00	0.00	0.00	0.07	6.07
60-64	15.23	0.27	0.00	0.00	0.00	0.27	0.84	0.00	0.00	0.00	0.10	6.05
65-69	15.36	1.35	0.00	0.00	0.00	1.35	5.59	0.14	0.00	0.14	0.71	7.25
70-74	10.56	3.65	0.10	0.00	0.07	3.82	13.85	0.98	0.00	0.00	1.78	7.72
75-79	4.14	7.47	0.57	0.00	0.17	8.21	18.46	0.42	0.00	0.28	2.30	7.97
80-84	1.41	10.75	1.79	0.07	0.17	12.77	14.97	1.54	0.00	0.00	1.98	8.88
85-89	0.97	10.65	2.87	0.10	0.34	13.96	11.19	2.94	0.00	0.00	1.70	9.01
90-94	0.92	10.71	3.85	0.37	0.30	15.24	8.53	2.24	0.28	0.14	1.35	9.28
95-99	0.70	11.42	3.89	0.34	0.34	15.99	6.15	1.68	0.00	0.00	0.94	9.17
100-104	0.53	8.11	3.31	0.20	0.14	11.76	3.22	0.98	0.00	0.00	0.50	6.56
105-109	0.26	4.80	1.72	0.14	0.03	6.69	2.24	0.28	0.00	0.00	0.30	3.73
110-114	0.18	2.77	1.05	0.07	0.00	3.89	0.84	0.14	0.00	0.00	0.12	2.12
115-119	0.00	1.69	0.47	0.03	0.00	2.20	0.14	0.14	0.00	0.00	0.03	1.13
120-124	0.09	1.25	0.41	0.07	0.00	1.72	0.00	0.56	0.00	0.00	0.07	0.96
125-129	0.00	0.57	0.30	0.10	0.03	1.01	0.28	0.14	0.00	0.00	0.05	0.55
130-134	0.00	0.20	0.17	0.00	0.00	0.37	0.00	0.14	0.00	0.00	0.02	0.20
135-139	0.00	0.20	0.17	0.00	0.00	0.37	0.00	0.00	0.00	0.00	0.00	0.18
140-144	0.00	0.10	0.00	0.00	0.03	0.14	0.00	0.00	0.00	0.00	0.00	0.07
145-149	0.00	0.03	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.02
150-154	0.00	0.10	0.00	0.00	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.05
155-159	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160-164	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
165-169	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
170-174	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
175-179	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	**38.21**	**76.21**	**20.68**	**1.49**	**1.62**	**49.76**	**86.85**	**12.31**	**0.28**	**0.56**	**12.02**	**100.00**

Table 10. (cont) Limnothrissa miodon. Maturity stage data in July 1993-June 1994.
Frequency distributions and % distributions according to maturity stages.
(All gears combined).

Uvira

Number of samples: 40

Year total Length group (mm)	Immatures (unident.) 1	Females Maturity stages 2	3	4	5	Total	Males Maturity stages 2	3	4	5	Total	Total number analysed
20-24	0	0	0	0	0	0	0	0	0	0	0	0
25-29	0	0	0	0	0	0	0	0	0	0	0	0
30-34	0	0	0	0	0	0	0	0	0	0	0	0
35-39	0	0	0	0	0	0	0	0	0	0	0	0
40-44	0	0	0	0	0	0	0	0	0	0	0	0
45-49	0	0	0	0	0	0	0	0	0	0	0	0
50-54	1	0	0	0	0	0	0	0	0	0	0	1
55-59	0	0	0	0	0	0	0	0	0	0	0	0
60-64	2	0	0	0	0	0	2	0	0	0	2	4
65-69	3	1	0	0	0	1	3	0	0	0	3	7
70-74	2	0	0	0	0	0	7	0	0	0	7	9
75-79	2	3	2	0	0	5	0	2	0	0	2	9
80-84	1	6	8	1	0	15	4	24	10	0	38	54
85-89	0	23	24	4	0	51	10	42	13	1	66	117
90-94	4	38	59	16	0	113	20	76	71	0	167	284
95-99	2	59	111	33	0	203	24	102	70	2	198	403
100-104	4	60	95	38	0	193	17	82	72	2	173	370
105-109	2	50	61	43	0	154	20	63	43	0	126	282
110-114	1	28	47	18	0	93	8	31	38	0	77	171
115-119	3	26	15	8	0	49	8	10	18	0	36	88
120-124	0	11	7	6	0	24	3	5	20	0	28	52
125-129	1	1	5	1	1	8	0	6	2	0	8	17
130-134	0	3	1	0	0	4	0	0	0	0	0	4
135-139	0	0	2	0	0	2	0	0	0	0	0	2
140-144	0	0	0	0	0	0	0	0	0	0	0	0
145-149	0	0	0	0	0	0	0	0	0	0	0	0
150-154	0	0	0	0	0	0	0	0	0	0	0	0
155-159	0	0	0	0	0	0	0	0	0	0	0	0
160-164	0	0	0	0	0	0	0	0	0	0	0	0
165-169	0	0	0	0	0	0	0	0	0	0	0	0
170-174	0	0	0	0	0	0	0	0	0	0	0	0
175-179	0	0	0	0	0	0	0	0	0	0	0	0
Total	28	309	437	168	1	915	126	443	357	5	931	1874

Length group (mm)	Immatures (unident.) % 1	Females % of various maturity stages 2	3	4	5	Females Total %	Males % of various maturity stages 2	3	4	5	Males Total %	Per cent of the total
20-24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25-29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30-34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
35-39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
40-44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
45-49	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
50-54	3.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05
55-59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.00
60-64	7.14	0.00	0.00	0.00	0.00	0.00	0.21	0.00	0.00	0.00	0.10	0.21
65-69	10.71	0.11	0.00	0.00	0.00	0.11	0.32	0.00	0.00	0.00	0.71	0.37
70-74	7.14	0.00	0.00	0.00	0.00	0.00	0.75	0.00	0.00	0.00	1.78	0.48
75-79	7.14	0.33	0.22	0.00	0.00	0.55	0.00	0.21	0.00	0.00	2.30	0.48
80-84	3.57	0.66	0.87	0.11	0.00	1.64	0.43	2.58	1.07	0.00	1.98	2.88
85-89	0.00	2.51	2.62	0.44	0.00	5.57	1.07	4.51	1.40	0.11	1.70	6.24
90-94	14.29	4.15	6.45	1.75	0.00	12.35	2.15	8.16	7.63	0.00	1.35	15.15
95-99	7.14	6.45	12.13	3.61	0.00	22.19	2.58	10.96	7.52	0.21	0.94	21.50
100-104	14.29	6.56	10.38	4.15	0.00	21.09	1.83	8.81	7.73	0.21	0.50	19.74
105-109	7.14	5.46	6.67	4.70	0.00	16.83	2.15	6.77	4.62	0.00	0.30	15.05
110-114	3.57	3.06	5.14	1.97	0.00	10.16	0.86	3.33	4.08	0.00	0.12	9.12
115-119	10.71	2.84	1.64	0.87	0.00	5.36	0.86	1.07	1.93	0.00	0.03	4.70
120-124	0.00	1.20	0.77	0.66	0.00	2.62	0.32	0.54	2.15	0.00	0.07	2.77
125-129	3.57	0.11	0.55	0.11	0.11	0.87	0.00	0.64	0.21	0.00	0.05	0.91
130-134	0.00	0.33	0.11	0.00	0.00	0.44	0.00	0.00	0.00	0.00	0.02	0.21
135-139	0.00	0.00	0.22	0.00	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.11
140-144	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
145-149	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
150-154	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
155-159	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160-164	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
165-169	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
170-174	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
175-179	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	1.49	33.77	47.76	18.36	0.11	48.83	13.53	47.58	38.35	0.54	49.68	100.00

Table 10. (cont) Limnothrissa miodon. Maturity stage data in July 1993-June 1994.
Frequency distributions and % distributions according to maturity stages.
(All gears combined).

Kigoma

Number of samples: 56

Year total Length group (mm)	Immatures (unident.) 1	Females Maturity stages 2	3	4	5	Total	Males Maturity stages 2	3	4	5	Total	Total number analysed
20-24	0	0	0	0	0	0	0	0	0	0	0	0
25-29	0	0	0	0	0	0	0	0	0	0	0	0
30-34	0	0	0	0	0	0	0	0	0	0	0	0
35-39	0	0	0	0	0	0	0	0	0	0	0	0
40-44	0	0	0	0	0	0	0	0	0	0	0	0
45-49	0	0	0	0	0	0	0	0	0	0	0	0
50-54	0	0	0	0	0	0	0	0	0	0	0	0
55-59	0	0	0	0	0	0	0	0	0	0	0	0
60-64	0	0	0	0	0	0	0	0	0	0	0	0
65-69	0	0	0	0	0	0	0	0	0	0	0	0
70-74	0	0	0	0	0	0	0	0	0	0	0	0
75-79	0	0	0	0	0	0	1	0	0	0	1	1
80-84	0	1	0	0	0	1	0	0	0	0	0	1
85-89	0	0	1	0	0	1	4	1	0	0	5	6
90-94	0	3	0	0	0	3	4	0	0	0	4	7
95-99	0	7	0	0	0	7	15	1	0	0	16	23
100-104	0	18	2	2	0	22	28	20	1	1	50	72
105-109	0	54	6	0	0	60	39	27	1	0	67	127
110-114	0	69	18	2	0	89	38	30	0	0	68	157
115-119	0	72	23	0	0	95	31	27	0	0	58	153
120-124	0	43	31	1	0	75	34	15	1	0	50	125
125-129	0	55	17	0	0	72	19	10	0	0	29	101
130-134	0	33	12	3	0	48	25	11	0	0	36	84
135-139	0	41	17	1	0	59	16	5	1	0	22	81
140-144	0	16	17	3	0	36	16	4	0	0	20	56
145-149	0	16	18	0	0	34	11	2	0	0	13	47
150-154	0	9	11	1	0	21	6	0	0	0	6	27
155-159	0	7	10	0	0	17	1	0	0	0	1	18
160-164	0	2	4	0	0	6	1	0	0	0	1	7
165-169	0	0	0	0	0	0	0	0	0	0	0	0
170-174	0	0	0	0	0	0	0	0	0	0	0	0
175-179	0	0	1	0	0	1	0	0	0	0	0	1
Total	**0**	**446**	**188**	**13**	**0**	**647**	**289**	**153**	**4**	**1**	**447**	**1094**

Length group (mm)	Immatures (unident.) % 1	Females % of various maturity stages 2	3	4	5	Females Total %	Males % of various maturity stages 2	3	4	5	Males Total %	Per cent of the total
20-24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25-29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30-34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
35-39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
40-44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
45-49	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
50-54	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
55-59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.00
60-64	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.00
65-69	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.71	0.00
70-74	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.78	0.00
75-79	0.00	0.00	0.00	0.00	0.00	0.00	0.22	0.00	0.00	0.00	2.30	0.09
80-84	0.00	0.15	0.00	0.00	0.00	0.15	0.00	0.00	0.00	0.00	1.98	0.09
85-89	0.00	0.00	0.15	0.00	0.00	0.15	0.89	0.22	0.00	0.00	1.70	0.55
90-94	0.00	0.46	0.00	0.00	0.00	0.46	0.89	0.00	0.00	0.00	1.35	0.64
95-99	0.00	1.08	0.00	0.00	0.00	1.08	3.36	0.22	0.00	0.00	0.94	2.10
100-104	0.00	2.78	0.31	0.31	0.00	3.40	6.26	4.47	0.22	0.22	0.50	6.58
105-109	0.00	8.35	0.93	0.00	0.00	9.27	8.72	6.04	0.22	0.00	0.30	11.61
110-114	0.00	10.66	2.78	0.31	0.00	13.76	8.50	6.71	0.00	0.00	0.12	14.35
115-119	0.00	11.13	3.55	0.00	0.00	14.68	6.94	6.04	0.00	0.00	0.03	13.99
120-124	0.00	6.65	4.79	0.15	0.00	11.59	7.61	3.36	0.22	0.00	0.07	11.43
125-129	0.00	8.50	2.63	0.00	0.00	11.13	4.25	2.24	0.00	0.00	0.05	9.23
130-134	0.00	5.10	1.85	0.46	0.00	7.42	5.59	2.46	0.00	0.00	0.02	7.68
135-139	0.00	6.34	2.63	0.15	0.00	9.12	3.58	1.12	0.22	0.00	0.00	7.40
140-144	0.00	2.47	2.63	0.46	0.00	5.56	3.58	0.89	0.00	0.00	0.00	5.12
145-149	0.00	2.47	2.78	0.00	0.00	5.26	2.46	0.45	0.00	0.00	0.00	4.30
150-154	0.00	1.39	1.70	0.15	0.00	3.25	1.34	0.00	0.00	0.00	0.00	2.47
155-159	0.00	1.08	1.55	0.00	0.00	2.63	0.22	0.00	0.00	0.00	0.00	1.65
160-164	0.00	0.31	0.62	0.00	0.00	0.93	0.22	0.00	0.00	0.00	0.00	0.64
165-169	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
170-174	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
175-179	0.00	0.00	0.15	0.00	0.00	0.15	0.00	0.00	0.00	0.00	0.00	0.09
Total	**0.00**	**68.93**	**29.06**	**2.01**	**0.00**	**59.14**	**64.65**	**34.23**	**0.89**	**0.22**	**40.86**	**100.00**

Table 10. (cont) Limnothrissa miodon. Maturity stage data in July 1993-June 1994.
Frequency distributions and % distributions according to maturity stages.
(All gears combined).

Mpulungu

Number of samples: 96

Year total Length group (mm)	Immatures (unident.) 1	Females Maturity stages 2	3	4	5	Total	Males Maturity stages 2	3	4	5	Total	Total number analysed
20-24	312	0	0	0	0	0	0	0	0	0	0	312
25-29	397	1	0	0	0	1	1	1	0	0	2	400
30-34	469	1	0	0	0	1	0	1	0	0	1	471
35-39	419	0	1	0	0	1	1	1	0	0	2	422
40-44	375	1	0	0	0	1	5	0	0	0	5	381
45-49	269	11	1	0	0	12	9	5	0	0	14	295
50-54	211	13	6	1	0	20	21	5	2	0	28	259
55-59	192	24	2	0	0	26	24	5	0	0	29	247
60-64	174	30	8	1	0	39	38	9	0	0	47	260
65-69	96	69	7	4	0	80	81	15	4	0	100	276
70-74	54	57	31	12	0	100	72	20	4	0	96	250
75-79	31	70	49	17	3	139	63	18	9	0	90	260
80-84	15	48	44	24	9	125	45	21	20	1	87	227
85-89	13	39	68	38	15	160	28	22	12	2	64	237
90-94	10	25	52	53	13	143	19	13	8	4	44	197
95-99	6	14	35	38	18	105	10	6	10	4	30	141
100-104	9	13	28	31	9	81	5	7	3	3	18	108
105-109	0	11	8	14	4	37	7	5	8	5	25	62
110-114	0	17	5	8	4	34	6	9	13	5	33	67
115-119	1	11	5	7	3	26	5	7	18	11	41	68
120-124	1	8	12	12	9	41	6	9	22	9	46	88
125-129	1	10	10	12	5	37	5	21	36	10	72	110
130-134	0	10	7	26	14	57	5	11	24	11	51	108
135-139	0	4	13	27	15	59	2	7	17	4	30	89
140-144	0	5	16	26	6	53	2	5	6	2	15	68
145-149	0	2	10	26	8	46	0	2	4	1	7	53
150-154	0	3	3	19	3	28	0	1	8	4	13	41
155-159	0	0	2	8	1	11	0	0	0	0	0	11
160-164	12	1	0	3	2	6	0	0	2	0	2	20
165-169	0	0	2	0	0	2	0	0	0	0	0	2
170-174	0	0	0	0	0	0	0	0	0	0	0	0
175-179	0	0	0	0	0	0	0	0	0	0	0	0
Total	3067	498	425	407	141	1471	460	226	230	76	992	5530

Length group (mm)	Immatures (unident.) % 1	Females % of various maturity stages 2	3	4	5	Females Total %	Males % of various maturity stages 2	3	4	5	Males Total %	Per cent of the total
20-24	10.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.64
25-29	12.94	0.07	0.00	0.00	0.00	0.07	0.10	0.10	0.00	0.00	0.00	7.23
30-34	15.29	0.07	0.00	0.00	0.00	0.07	0.00	0.10	0.00	0.00	0.00	8.52
35-39	13.66	0.00	0.07	0.00	0.00	0.07	0.10	0.10	0.00	0.00	0.00	7.63
40-44	12.23	0.07	0.00	0.00	0.00	0.07	0.50	0.00	0.00	0.00	0.00	6.89
45-49	8.77	0.75	0.07	0.00	0.00	0.82	0.91	0.50	0.00	0.00	0.00	5.33
50-54	6.88	0.88	0.41	0.07	0.00	1.36	2.12	0.50	0.20	0.00	0.00	4.68
55-59	6.26	1.63	0.14	0.00	0.00	1.77	2.42	0.50	0.00	0.00	0.07	4.47
60-64	5.67	2.04	0.54	0.07	0.00	2.65	3.83	0.91	0.00	0.00	0.10	4.70
65-69	3.13	4.69	0.48	0.27	0.00	5.44	8.17	1.51	0.40	0.00	0.71	4.99
70-74	1.76	3.87	2.11	0.82	0.00	6.80	7.26	2.02	0.40	0.00	1.78	4.52
75-79	1.01	4.76	3.33	1.16	0.20	9.45	6.35	1.81	0.91	0.00	2.30	4.70
80-84	0.49	3.26	2.99	1.63	0.61	8.50	4.54	2.12	2.02	0.10	1.98	4.10
85-89	0.42	2.65	4.62	2.58	1.02	10.88	2.82	2.22	1.21	0.20	1.70	4.29
90-94	0.33	1.70	3.54	3.60	0.88	9.72	1.92	1.31	0.81	0.40	1.35	3.56
95-99	0.20	0.95	2.38	2.58	1.22	7.14	1.01	0.60	1.01	0.40	0.94	2.55
100-104	0.29	0.88	1.90	2.11	0.61	5.51	0.50	0.71	0.30	0.30	0.50	1.95
105-109	0.00	0.75	0.54	0.95	0.27	2.52	0.71	0.50	0.81	0.50	0.30	1.12
110-114	0.00	1.16	0.34	0.54	0.27	2.31	0.60	0.91	1.31	0.50	0.12	1.21
115-119	0.03	0.75	0.34	0.48	0.20	1.77	0.50	0.71	1.81	1.11	0.03	1.23
120-124	0.03	0.54	0.82	0.82	0.61	2.79	0.60	0.91	2.22	0.91	0.07	1.59
125-129	0.03	0.68	0.68	0.82	0.34	2.52	0.50	2.12	3.63	1.01	0.05	1.99
130-134	0.00	0.68	0.48	1.77	0.95	3.87	0.50	1.11	2.42	1.11	0.02	1.95
135-139	0.00	0.27	0.88	1.84	1.02	4.01	0.20	0.71	1.71	0.40	0.00	1.61
140-144	0.00	0.34	1.09	1.77	0.41	3.60	0.20	0.50	0.60	0.20	0.00	1.23
145-149	0.00	0.14	0.68	1.77	0.54	3.13	0.00	0.20	0.40	0.10	0.00	0.96
150-154	0.00	0.20	0.20	1.29	0.20	1.90	0.00	0.10	0.81	0.40	0.00	0.74
155-159	0.00	0.00	0.14	0.54	0.07	0.75	0.00	0.00	0.00	0.00	0.00	0.20
160-164	0.39	0.07	0.00	0.20	0.14	0.41	0.00	0.00	0.20	0.00	0.00	0.36
165-169	0.00	0.00	0.14	0.00	0.00	0.14	0.00	0.00	0.00	0.00	0.00	0.04
170-174	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
175-179	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	55.46	33.85	28.89	27.67	9.59	26.60	46.37	22.78	23.19	7.66	17.94	100.00

Table 11. Stolothrissa tanganicae. Maturity stage data in July 1993-June 1994.
Frequency distributions and % distributions according to maturity stages.
(All gears combined).

Bujumbura

Number of samples: 116

Year total Length group (mm)	Immatures (unident.) 1	Females Maturity stages 2	3	4	5	Total	Males Maturity stages 2	3	4	5	Total	Total number analysed
20-24	11	0	0	0	0	0	0	0	0	0	0	11
25-29	43	0	0	0	0	0	0	0	0	0	0	43
30-34	73	0	0	0	0	0	0	0	0	0	0	73
35-39	106	0	0	0	0	0	0	0	0	0	0	106
40-44	190	0	0	0	0	0	0	0	0	0	0	190
45-49	258	0	0	0	0	0	0	0	0	0	0	258
50-54	461	0	0	0	0	0	0	0	0	0	0	461
55-59	512	21	0	0	0	21	4	0	0	0	4	537
60-64	571	32	0	0	0	32	17	0	0	0	17	620
65-69	416	108	1	0	0	109	77	0	0	0	77	602
70-74	218	166	6	0	0	172	135	4	0	0	139	529
75-79	46	197	27	1	0	225	98	20	0	0	118	389
80-84	11	128	36	3	0	167	46	28	1	0	75	253
85-89	0	65	39	8	0	112	13	22	6	0	41	153
90-94	0	28	29	21	1	79	5	20	4	0	29	108
95-99	0	16	16	13	1	46	3	9	4	0	16	62
100-104	0	4	6	2	0	12	0	0	0	0	0	12
105-109	0	1	2	0	0	3	0	0	0	0	0	3
110-114	0	0	0	0	0	0	0	0	0	0	0	0
115-119	0	0	0	0	0	0	0	0	0	0	0	0
120-124	0	0	0	0	0	0	0	0	0	0	0	0
125-129	0	0	0	0	0	0	0	0	0	0	0	0
130-134	0	0	0	0	0	0	0	0	0	0	0	0
135-139	0	0	0	0	0	0	0	0	0	0	0	0
140-144	0	0	0	0	0	0	0	0	0	0	0	0
145-149	0	0	0	0	0	0	0	0	0	0	0	0
150-154	0	0	0	0	0	0	0	0	0	0	0	0
155-159	0	0	0	0	0	0	0	0	0	0	0	0
160-164	0	0	0	0	0	0	0	0	0	0	0	0
165-169	0	0	0	0	0	0	0	0	0	0	0	0
170-174	0	0	0	0	0	0	0	0	0	0	0	0
175-179	0	0	0	0	0	0	0	0	0	0	0	0
Total	2916	766	162	48	2	978	398	103	15	0	516	4410

Length group (mm)	Immatures (unident.) % 1	Females % of various maturity stages 2	3	4	5	Females Total %	Males % of various maturity stages 2	3	4	5	Males Total %	Per cent of the total
20-24	0.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25
25-29	1.47	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.98
30-34	2.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.66
35-39	3.64	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.40
40-44	6.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.31
45-49	8.85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.85
50-54	15.81	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.45
55-59	17.56	2.15	0.00	0.00	0.00	2.15	0.78	0.00	0.00	0.00	0.07	12.18
60-64	19.58	3.27	0.00	0.00	0.00	3.27	3.29	0.00	0.00	0.00	0.10	14.06
65-69	14.27	11.04	0.10	0.00	0.00	11.15	14.92	0.00	0.00	0.00	0.71	13.65
70-74	7.48	16.97	0.61	0.00	0.00	17.59	26.16	0.78	0.00	0.00	1.78	12.00
75-79	1.58	20.14	2.76	0.10	0.00	23.01	18.99	3.88	0.00	0.00	2.30	8.82
80-84	0.38	13.09	3.68	0.31	0.00	17.08	8.91	5.43	0.19	0.00	1.98	5.74
85-89	0.00	6.65	3.99	0.82	0.00	11.45	2.52	4.26	1.16	0.00	1.70	3.47
90-94	0.00	2.86	2.97	2.15	0.10	8.08	0.97	3.88	0.78	0.00	1.35	2.45
95-99	0.00	1.64	1.64	1.33	0.10	4.70	0.58	1.74	0.78	0.00	0.94	1.41
100-104	0.00	0.41	0.61	0.20	0.00	1.23	0.00	0.00	0.00	0.00	0.50	0.27
105-109	0.00	0.10	0.20	0.00	0.00	0.31	0.00	0.00	0.00	0.00	0.30	0.07
110-114	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.00
115-119	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00
120-124	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.00
125-129	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00
130-134	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00
135-139	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
140-144	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
145-149	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
150-154	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
155-159	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160-164	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
165-169	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
170-174	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
175-179	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	66.12	78.32	16.56	4.91	0.20	22.18	77.13	19.96	2.91	0.00	11.70	100.00

Table 11. (cont) Stolothrissa tanganicae. Maturity stage data in July 1993-June 1994.
Frequency distributions and % distributions according to maturity stages.
(All gears combined).

Uvira

Number of samples: 54

Year total Length group (mm)	Immatures (unident.) 1	Females Maturity stages 2	3	4	5	Total	Males Maturity stages 2	3	4	5	Total	Total number analysed
20-24	0	0	0	0	0	0	0	0	0	0	0	0
25-29	0	0	0	0	0	0	0	0	0	0	0	0
30-34	20	0	0	0	0	0	0	0	0	0	0	20
35-39	30	0	0	0	0	0	0	0	0	0	0	30
40-44	31	0	0	0	0	0	0	0	0	0	0	31
45-49	48	0	0	0	0	0	0	0	0	0	0	48
50-54	130	0	0	0	0	0	0	0	0	0	0	130
55-59	131	14	0	0	0	14	5	3	0	0	8	153
60-64	260	84	0	0	0	84	26	9	0	0	35	379
65-69	237	170	6	0	0	176	56	7	1	0	64	477
70-74	80	283	37	0	0	320	115	40	4	0	159	559
75-79	20	243	84	8	0	335	98	120	9	0	227	582
80-84	0	178	165	14	0	357	67	212	48	0	327	684
85-89	0	71	135	37	0	243	12	178	71	0	261	504
90-94	0	46	116	35	0	197	4	94	73	0	171	368
95-99	0	36	84	31	0	151	4	42	33	0	79	230
100-104	0	12	45	12	0	69	0	9	12	0	21	90
105-109	0	0	3	3	0	6	0	1	0	0	1	7
110-114	0	1	0	0	0	1	0	1	0	0	1	2
115-119	0	0	0	0	0	0	0	0	0	0	0	0
120-124	0	0	0	0	0	0	0	0	0	0	0	0
125-129	0	0	0	0	0	0	0	0	0	0	0	0
130-134	0	0	0	0	0	0	0	0	0	0	0	0
135-139	0	0	0	0	0	0	0	0	0	0	0	0
140-144	0	0	0	0	0	0	0	0	0	0	0	0
145-149	0	0	0	0	0	0	0	0	0	0	0	0
150-154	0	0	0	0	0	0	0	0	0	0	0	0
155-159	0	0	0	0	0	0	0	0	0	0	0	0
160-164	0	0	0	0	0	0	0	0	0	0	0	0
165-169	0	0	0	0	0	0	0	0	0	0	0	0
170-174	0	0	0	0	0	0	0	0	0	0	0	0
175-179	0	0	0	0	0	0	0	0	0	0	0	0
Total	987	1138	675	140	0	1953	387	716	251	0	1354	4294

Length group (mm)	Immatures (unident.) % 1	Females % of various maturity stages 2	3	4	5	Females Total %	Males % of various maturity stages 2	3	4	5	Males Total %	Per cent of the total
20-24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25-29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30-34	2.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.47
35-39	3.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.70
40-44	3.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.72
45-49	4.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.12
50-54	13.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.03
55-59	13.27	0.72	0.00	0.00	0.00	0.72	0.37	0.22	0.00	0.00	0.07	3.56
60-64	26.34	4.30	0.00	0.00	0.00	4.30	1.92	0.66	0.00	0.00	0.10	8.83
65-69	24.01	8.70	0.31	0.00	0.00	9.01	4.14	0.52	0.07	0.00	0.71	11.11
70-74	8.11	14.49	1.89	0.00	0.00	16.39	8.49	2.95	0.30	0.00	1.78	13.02
75-79	2.03	12.44	4.30	0.41	0.00	17.15	7.24	8.86	0.66	0.00	2.30	13.55
80-84	0.00	9.11	8.45	0.72	0.00	18.28	4.95	15.66	3.55	0.00	1.98	15.93
85-89	0.00	3.64	6.91	1.89	0.00	12.44	0.89	13.15	5.24	0.00	1.70	11.74
90-94	0.00	2.36	5.94	1.79	0.00	10.09	0.30	6.94	5.39	0.00	1.35	8.57
95-99	0.00	1.84	4.30	1.59	0.00	7.73	0.30	3.10	2.44	0.00	0.94	5.36
100-104	0.00	0.61	2.30	0.61	0.00	3.53	0.00	0.66	0.89	0.00	0.50	2.10
105-109	0.00	0.00	0.15	0.15	0.00	0.31	0.00	0.07	0.00	0.00	0.30	0.16
110-114	0.00	0.05	0.00	0.00	0.00	0.05	0.00	0.07	0.00	0.00	0.12	0.05
115-119	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00
120-124	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.00
125-129	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00
130-134	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00
135-139	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
140-144	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
145-149	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
150-154	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
155-159	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160-164	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
165-169	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
170-174	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
175-179	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	22.99	58.27	34.56	7.17	0.00	45.48	28.58	52.88	18.54	0.00	31.53	100.00

Table 11. (cont) **Stolothrissa tanganicae. Maturity stage data in July 1993-June 1994. Frequency distributions and % distributions according to maturity stages. (All gears combined).**

Kigoma

Number of samples: 129

Year total Length group (mm)	Immatures (unident.) 1	Females Maturity stages 2	3	4	5	Total	Males Maturity stages 2	3	4	5	Total	Total number analysed
20-24	2	0	0	0	0	0	0	0	0	0	0	2
25-29	0	0	0	0	0	0	0	0	0	0	0	0
30-34	11	0	0	0	0	0	0	0	0	0	0	11
35-39	38	0	0	0	0	0	0	0	0	0	0	38
40-44	82	0	0	0	0	0	0	0	0	0	0	82
45-49	157	0	0	0	0	0	0	0	0	0	0	157
50-54	244	0	0	0	0	0	1	0	0	0	1	245
55-59	420	6	0	0	0	6	5	0	0	0	5	431
60-64	534	59	0	0	0	59	39	0	0	0	39	632
65-69	317	280	0	0	0	280	180	1	0	0	181	778
70-74	52	496	29	0	0	525	326	36	1	0	363	940
75-79	5	508	112	3	0	623	357	115	5	0	477	1105
80-84	2	441	208	31	0	680	257	201	14	0	472	1154
85-89	0	417	289	52	1	759	138	166	30	0	334	1093
90-94	0	317	274	56	4	651	61	114	21	0	196	847
95-99	0	129	145	42	1	317	20	34	15	0	69	386
100-104	0	20	21	14	2	57	1	8	2	0	11	68
105-109	0	1	2	0	0	3	0	1	0	0	1	4
110-114	0	0	0	0	0	0	0	0	0	0	0	0
115-119	0	0	0	0	0	0	0	0	0	0	0	0
120-124	0	0	0	0	0	0	0	0	0	0	0	0
125-129	0	0	0	0	0	0	0	0	0	0	0	0
130-134	0	0	0	0	0	0	0	0	0	0	0	0
135-139	0	0	0	0	0	0	0	0	0	0	0	0
140-144	0	0	0	0	0	0	0	0	0	0	0	0
145-149	0	0	0	0	0	0	0	0	0	0	0	0
150-154	0	0	0	0	0	0	0	0	0	0	0	0
155-159	0	0	0	0	0	0	0	0	0	0	0	0
160-164	0	0	0	0	0	0	0	0	0	0	0	0
165-169	0	0	0	0	0	0	0	0	0	0	0	0
170-174	0	0	0	0	0	0	0	0	0	0	0	0
175-179	0	0	0	0	0	0	0	0	0	0	0	0
Total	1864	2674	1080	198	8	3960	1385	676	88	0	2149	7973

Length group (mm)	Immatures (unident.) % 1	Females % of various maturity stages 2	3	4	5	Females Total %	Males % of various maturity stages 2	3	4	5	Males Total %	Per cent of the total
20-24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03
25-29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30-34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14
35-39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.48
40-44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.03
45-49	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.97
50-54	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.00	3.07
55-59	0.00	0.15	0.00	0.00	0.00	0.15	0.23	0.00	0.00	0.00	0.07	5.41
60-64	0.00	1.49	0.00	0.00	0.00	1.49	1.81	0.00	0.00	0.00	0.10	7.93
65-69	0.00	7.07	0.00	0.00	0.00	7.07	8.38	0.05	0.00	0.00	0.71	9.76
70-74	0.00	12.53	0.73	0.00	0.00	13.26	15.17	1.68	0.05	0.00	1.78	11.79
75-79	0.00	12.83	2.83	0.08	0.00	15.73	16.61	5.35	0.23	0.00	2.30	13.86
80-84	0.00	11.14	5.25	0.78	0.00	17.17	11.96	9.35	0.65	0.00	1.98	14.47
85-89	0.00	10.53	7.30	1.31	0.03	19.17	6.42	7.72	1.40	0.00	1.70	13.71
90-94	0.00	8.01	6.92	1.41	0.10	16.44	2.84	5.30	0.98	0.00	1.35	10.62
95-99	0.00	3.26	3.66	1.06	0.03	8.01	0.93	1.58	0.70	0.00	0.94	4.84
100-104	0.00	0.51	0.53	0.35	0.05	1.44	0.05	0.37	0.09	0.00	0.50	0.85
105-109	0.00	0.03	0.05	0.00	0.00	0.08	0.00	0.05	0.00	0.00	0.30	0.05
110-114	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.00
115-119	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00
120-124	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.00
125-129	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00
130-134	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00
135-139	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
140-144	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
145-149	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
150-154	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
155-159	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160-164	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
165-169	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
170-174	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
175-179	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	23.38	67.53	27.27	5.00	0.20	49.67	64.45	31.46	4.09	0.00	26.95	100.00

Table 11. (cont) Stolothrissa tanganicae. Maturity stage data in July 1993-June 1994.
Frequency distributions and % distributions according to maturity stages.
(All gears combined).

Mpulungu

Number of samples: 40

Year total Length group (mm)	Immatures (unident.) 1	Females Maturity stages 2	3	4	5	Total	Males Maturity stages 2	3	4	5	Total	Total number analysed
20-24	29	0	0	0	0	0	0	0	0	0	0	29
25-29	69	0	0	0	0	0	0	0	0	0	0	69
30-34	73	0	0	0	0	0	0	0	0	0	0	73
35-39	63	0	0	0	0	0	0	0	0	0	0	63
40-44	80	0	0	0	0	0	0	0	0	0	0	80
45-49	62	9	1	0	0	10	5	1	0	0	6	78
50-54	52	13	1	0	0	14	6	3	0	0	9	75
55-59	44	9	0	0	0	9	10	3	0	0	13	66
60-64	32	9	1	0	0	10	8	1	0	0	9	51
65-69	26	12	2	0	0	14	13	3	0	0	16	56
70-74	11	31	11	4	0	46	28	6	1	0	35	92
75-79	4	25	15	12	1	53	20	10	7	0	37	94
80-84	2	24	24	17	1	66	12	22	16	0	50	118
85-89	0	19	26	36	4	85	6	8	11	0	25	110
90-94	0	10	47	67	3	127	5	3	13	5	26	153
95-99	0	5	45	77	6	133	5	13	18	12	48	181
100-104	0	13	33	58	12	116	0	4	21	8	33	149
105-109	0	3	38	52	8	101	2	3	11	8	24	125
110-114	0	3	9	21	3	36	0	0	8	3	11	47
115-119	0	1	1	7	2	11	0	0	3	0	3	14
120-124	0	0	0	0	0	0	0	0	0	0	0	0
125-129	0	0	0	0	0	0	0	0	0	0	0	0
130-134	0	0	0	0	0	0	0	0	0	0	0	0
135-139	0	0	0	0	0	0	0	0	0	0	0	0
140-144	0	0	0	0	0	0	0	0	0	0	0	0
145-149	0	0	0	0	0	0	0	0	0	0	0	0
150-154	0	0	0	0	0	0	0	0	0	0	0	0
155-159	0	0	0	0	0	0	0	0	0	0	0	0
160-164	0	0	0	0	0	0	0	0	0	0	0	0
165-169	0	0	0	0	0	0	0	0	0	0	0	0
170-174	0	0	0	0	0	0	0	0	0	0	0	0
175-179	0	0	0	0	0	0	0	0	0	0	0	0
Total	547	186	254	351	40	831	120	80	109	36	345	1723

Length group (mm)	Immatures (unident.) % 1	Females % of various maturity stages 2	3	4	5	Females Total %	Males % of various maturity stages 2	3	4	5	Males Total %	Per cent of the total
20-24	5.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.68
25-29	12.61	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.00
30-34	13.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.24
35-39	11.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.66
40-44	14.63	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.64
45-49	11.33	1.08	0.12	0.00	0.00	1.20	1.45	0.29	0.00	0.00	0.00	4.53
50-54	9.51	1.56	0.12	0.00	0.00	1.68	1.74	0.87	0.00	0.00	0.00	4.35
55-59	8.04	1.08	0.00	0.00	0.00	1.08	2.90	0.87	0.00	0.00	0.07	3.83
60-64	5.85	1.08	0.12	0.00	0.00	1.20	2.32	0.29	0.00	0.00	0.10	2.96
65-69	4.75	1.44	0.24	0.00	0.00	1.68	3.77	0.87	0.00	0.00	0.71	3.25
70-74	2.01	3.73	1.32	0.48	0.00	5.54	8.12	1.74	0.29	0.00	1.78	5.34
75-79	0.73	3.01	1.81	1.44	0.12	6.38	5.80	2.90	2.03	0.00	2.30	5.46
80-84	0.37	2.89	2.89	2.05	0.12	7.94	3.48	6.38	4.64	0.00	1.98	6.85
85-89	0.00	2.29	3.13	4.33	0.48	10.23	1.74	2.32	3.19	0.00	1.70	6.38
90-94	0.00	1.20	5.66	8.06	0.36	15.28	1.45	0.87	3.77	1.45	1.35	8.88
95-99	0.00	0.60	5.42	9.27	0.72	16.00	1.45	3.77	5.22	3.48	0.94	10.50
100-104	0.00	1.56	3.97	6.98	1.44	13.96	0.00	1.16	6.09	2.32	0.50	8.65
105-109	0.00	0.36	4.57	6.26	0.96	12.15	0.58	0.87	3.19	2.32	0.30	7.25
110-114	0.00	0.36	1.08	2.53	0.36	4.33	0.00	0.00	2.32	0.87	0.12	2.73
115-119	0.00	0.12	0.12	0.84	0.24	1.32	0.00	0.00	0.87	0.00	0.03	0.81
120-124	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.00
125-129	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00
130-134	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00
135-139	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
140-144	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
145-149	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
150-154	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
155-159	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160-164	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
165-169	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
170-174	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
175-179	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	31.75	22.38	30.57	42.24	4.81	48.23	34.78	23.19	31.59	10.43	20.02	100.00

Table 12. Lates stappersi. Maturity stage data in July 1993-June 1994.
Frequency distributions and % distributions according to maturity stages.
(All gears combined).

Bujumbura

Number of samples: 24

Year total Length group (mm)	Immatures (unident.) 1	Females Maturity stages 2	3	4	5	Total	Males Maturity stages 2	3	4	5	Total	Total number analysed
100-109	153	1	0	0	0	1	0	0	0	0	0	154
110-119	73	3	0	0	0	3	1	0	0	0	1	77
120-129	20	7	0	0	0	7	4	0	0	0	4	31
130-139	13	14	0	0	0	14	5	0	0	0	5	32
140-149	7	15	0	0	0	15	7	0	0	0	7	29
150-159	1	1	0	1	0	2	2	0	0	0	2	5
160-169	0	2	0	0	0	2	2	0	0	0	2	4
170-179	0	0	0	0	0	0	1	0	0	0	1	1
180-189	0	1	0	0	0	1	0	0	0	0	0	1
190-199	0	3	0	0	0	3	3	0	0	0	3	6
200-209	0	2	0	0	0	2	2	0	0	0	2	4
210-219	3	1	0	0	0	1	2	0	0	0	2	6
220-229	1	2	0	0	0	2	2	0	0	0	2	5
230-239	3	3	0	0	0	3	1	0	0	0	1	7
240-249	2	3	0	0	0	3	3	0	0	0	3	8
250-259	1	0	0	0	0	0	0	0	0	0	0	1
260-269	1	0	0	0	0	0	0	0	0	0	0	1
270-279	0	0	0	0	0	0	0	0	0	0	0	0
280-289	0	0	0	0	0	0	0	0	0	0	0	0
290-299	0	0	0	0	0	0	0	0	0	0	0	0
300-309	0	0	0	0	0	0	0	0	0	0	0	0
310-319	0	0	0	0	0	0	0	0	0	0	0	0
320-329	0	0	0	0	0	0	0	0	0	0	0	0
330-339	0	0	0	0	0	0	0	0	0	0	0	0
340-349	0	0	0	0	0	0	0	0	0	0	0	0
350-359	0	0	0	0	0	0	0	0	0	0	0	0
360-369	0	0	0	0	0	0	0	0	0	0	0	0
370-379	0	0	0	0	0	0	0	0	0	0	0	0
380-389	0	0	0	0	0	0	0	0	0	0	0	0
390-399	0	0	0	0	0	0	0	0	0	0	0	0
400-409	0	0	0	0	0	0	0	0	0	0	0	0
410-419	0	0	0	0	0	0	0	0	0	0	0	0
420-429	0	0	0	0	0	0	0	0	0	0	0	0
430-439	0	0	0	0	0	0	0	0	0	0	0	0
440-449	0	0	0	0	0	0	0	0	0	0	0	0
450-459	0	0	0	0	0	0	0	0	0	0	0	0
460-469	0	0	0	0	0	0	0	0	0	0	0	0
470-479	0	0	0	0	0	0	0	0	0	0	0	0
480-489	0	0	0	0	0	0	0	0	0	0	0	0
490-499	0	0	0	0	0	0	0	0	0	0	0	0
Total	278	58	0	1	0	59	35	0	0	0	35	372

Table 12. (cont)

Length group (mm)	Immatures (unident.) % 1	Females % of various maturity stages 2	3	4	5	Females Total %	Males % of various maturity stages 2	3	4	5	Males Total %	Per cent of the total
100-109	55.04	1.69	0.00	0.00	0.00	1.69	0.00	0.00	0.00	0.00	0.00	41.40
110-119	26.26	5.08	0.00	0.00	0.00	5.08	2.86	0.00	0.00	0.00	2.86	20.70
120-129	7.19	11.86	0.00	0.00	0.00	11.86	11.43	0.00	0.00	0.00	11.43	8.33
130-139	4.68	23.73	0.00	0.00	0.00	23.73	14.29	0.00	0.00	0.00	14.29	8.60
140-149	2.52	25.42	0.00	0.00	0.00	25.42	20.00	0.00	0.00	0.00	20.00	7.80
150-159	0.36	1.69	0.00	1.69	0.00	3.39	5.71	0.00	0.00	0.00	5.71	1.34
160-169	0.00	3.39	0.00	0.00	0.00	3.39	5.71	0.00	0.00	0.00	5.71	1.08
170-179	0.00	0.00	0.00	0.00	0.00	0.00	2.86	0.00	0.00	0.00	2.86	0.27
180-189	0.00	1.69	0.00	0.00	0.00	1.69	0.00	0.00	0.00	0.00	0.00	0.27
190-199	0.00	5.08	0.00	0.00	0.00	5.08	8.57	0.00	0.00	0.00	8.57	1.61
200-209	0.00	3.39	0.00	0.00	0.00	3.39	5.71	0.00	0.00	0.00	5.71	1.08
210-219	1.08	1.69	0.00	0.00	0.00	1.69	5.71	0.00	0.00	0.00	5.71	1.61
220-229	0.36	3.39	0.00	0.00	0.00	3.39	5.71	0.00	0.00	0.00	5.71	1.34
230-239	1.08	5.08	0.00	0.00	0.00	5.08	2.86	0.00	0.00	0.00	2.86	1.88
240-249	0.72	5.08	0.00	0.00	0.00	5.08	8.57	0.00	0.00	0.00	8.57	2.15
250-259	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.27
260-269	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.27
270-279	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
280-289	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
290-299	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
300-309	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
310-319	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
320-329	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
330-339	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
340-349	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
350-359	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
360-369	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
370-379	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
380-389	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
390-399	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
400-409	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
410-419	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
420-429	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
430-439	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
440-449	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
450-459	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
460-469	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
470-479	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
480-489	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
490-499	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	74.73	98.31	0.00	1.69	0.00	15.86	100.00	0.00	0.00	0.00	9.41	100.00

Table 12. (cont) Lates stappersi. Maturity stage data in July 1993-June 1994.
Frequency distributions and % distributions according to maturity stages.
(All gears combined).

Uvira

Number of samples: 31

Year total Length group (mm)	Immatures (unident.) 1	Females Maturity stages 2	3	4	5	Total	Males Maturity stages 2	3	4	5	Total	Total number analysed
100-109	130	0	0	0	0	0	0	0	0	0	0	130
110-119	199	2	0	0	0	2	4	0	0	0	4	205
120-129	56	22	0	0	0	22	14	1	0	0	15	93
130-139	6	2	0	0	0	2	8	0	0	0	8	16
140-149	0	1	0	0	0	1	3	0	0	0	3	4
150-159	3	0	0	0	0	0	1	0	0	0	1	4
160-169	54	0	0	0	0	0	0	0	0	0	0	54
170-179	40	0	0	0	0	0	0	0	0	0	0	40
180-189	8	6	1	0	0	7	8	2	0	0	10	25
190-199	6	7	4	0	0	11	5	3	0	0	8	25
200-209	4	4	4	1	0	9	4	6	1	0	11	24
210-219	2	4	4	4	0	12	3	3	2	0	8	22
220-229	0	0	0	0	0	0	0	1	0	0	1	1
230-239	0	0	0	0	0	0	0	0	0	0	0	0
240-249	0	0	0	0	0	0	0	0	0	0	0	0
250-259	0	0	0	0	0	0	0	0	0	0	0	0
260-269	0	0	0	0	0	0	0	0	0	0	0	0
270-279	0	0	0	0	0	0	0	0	0	0	0	0
280-289	0	0	0	0	0	0	0	0	0	0	0	0
290-299	0	0	0	0	0	0	0	0	0	0	0	0
300-309	0	0	0	0	0	0	0	0	0	0	0	0
310-319	0	0	0	0	0	0	0	1	0	0	1	1
320-329	0	0	1	0	0	1	0	0	0	0	0	1
330-339	0	0	0	0	0	0	0	0	0	0	0	0
340-349	0	0	0	0	0	0	0	2	0	0	2	2
350-359	0	0	2	0	0	2	0	0	0	0	0	2
360-369	0	0	0	0	0	0	0	0	0	0	0	0
370-379	0	0	0	0	0	0	0	0	0	0	0	0
380-389	0	0	0	0	0	0	0	0	0	0	0	0
390-399	0	0	0	0	0	0	0	0	0	0	0	0
400-409	0	0	0	0	0	0	0	0	0	0	0	0
410-419	0	0	0	0	0	0	0	0	0	0	0	0
420-429	0	0	0	0	0	0	0	0	0	0	0	0
430-439	0	0	0	0	0	0	0	0	0	0	0	0
440-449	0	0	0	0	0	0	0	0	0	0	0	0
450-459	0	0	0	0	0	0	0	0	0	0	0	0
460-469	0	0	0	0	0	0	0	0	0	0	0	0
470-479	0	0	0	0	0	0	0	0	0	0	0	0
480-489	0	0	0	0	0	0	0	0	0	0	0	0
490-499	0	0	0	0	0	0	0	0	0	0	0	0
Total	508	48	16	5	0	69	50	19	3	0	72	649

Table 12. (cont)

Length group (mm)	Immatures (unident.) % 1	Females % of various maturity stages 2	3	4	5	Females Total %	Males % of various maturity stages 2	3	4	5	Males Total %	Per cent of the total
100-109	25.59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	20.03
110-119	39.17	2.90	0.00	0.00	0.00	2.90	5.56	0.00	0.00	0.00	5.56	31.59
120-129	11.02	31.88	0.00	0.00	0.00	31.88	19.44	1.39	0.00	0.00	20.83	14.33
130-139	1.18	2.90	0.00	0.00	0.00	2.90	11.11	0.00	0.00	0.00	11.11	2.47
140-149	0.00	1.45	0.00	0.00	0.00	1.45	4.17	0.00	0.00	0.00	4.17	0.62
150-159	0.59	0.00	0.00	0.00	0.00	0.00	1.39	0.00	0.00	0.00	1.39	0.62
160-169	10.63	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.32
170-179	7.87	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.16
180-189	1.57	8.70	1.45	0.00	0.00	10.14	11.11	2.78	0.00	0.00	13.89	3.85
190-199	1.18	10.14	5.80	0.00	0.00	15.94	6.94	4.17	0.00	0.00	11.11	3.85
200-209	0.79	5.80	5.80	1.45	0.00	13.04	5.56	8.33	1.39	0.00	15.28	3.70
210-219	0.39	5.80	5.80	5.80	0.00	17.39	4.17	4.17	2.78	0.00	11.11	3.39
220-229	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.39	0.00	0.00	1.39	0.15
230-239	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
240-249	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
250-259	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
260-269	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
270-279	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
280-289	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
290-299	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
300-309	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
310-319	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.39	0.00	0.00	1.39	0.15
320-329	0.00	0.00	1.45	0.00	0.00	1.45	0.00	0.00	0.00	0.00	0.00	0.15
330-339	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
340-349	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.78	0.00	0.00	2.78	0.31
350-359	0.00	0.00	2.90	0.00	0.00	2.90	0.00	0.00	0.00	0.00	0.00	0.31
360-369	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
370-379	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
380-389	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
390-399	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
400-409	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
410-419	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
420-429	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
430-439	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
440-449	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
450-459	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
460-469	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
470-479	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
480-489	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
490-499	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	78.27	69.57	23.19	7.25	0.00	10.63	69.44	26.39	4.17	0.00	11.09	100.00

Table 12. (cont)

Lates stappersi. Maturity stage data in July 1993-June 1994.
Frequency distributions and % distributions according to maturity stages.
(All gears combined).

Kigoma

Number of samples: 68

Year total Length group (mm)	Immatures (unident.)	Females Maturity stages					Males Maturity stages					Total number analysed
	1	2	3	4	5	Total	2	3	4	5	Total	
100-109	172	0	0	0	0	0	0	0	0	0	0	172
110-119	182	0	0	0	0	0	0	0	0	0	0	182
120-129	176	1	0	0	0	1	5	0	0	0	5	182
130-139	117	0	0	0	0	0	0	0	0	0	0	117
140-149	74	0	0	0	0	0	4	0	0	0	4	78
150-159	34	7	0	0	0	7	16	0	0	0	16	57
160-169	17	14	0	0	0	14	29	0	0	0	29	60
170-179	7	22	0	0	0	22	31	0	0	0	31	60
180-189	0	16	0	0	0	16	16	1	0	0	17	33
190-199	0	7	0	0	0	7	11	0	0	0	11	18
200-209	0	1	0	0	0	1	9	1	0	0	10	11
210-219	0	2	0	0	0	2	6	0	0	0	6	8
220-229	0	6	1	0	0	7	9	2	0	0	11	18
230-239	0	11	2	0	0	13	5	1	2	0	8	21
240-249	0	17	2	0	0	19	24	1	1	0	26	45
250-259	0	24	6	1	0	31	30	7	0	0	37	68
260-269	0	22	17	1	0	40	19	13	2	0	34	74
270-279	0	21	15	0	0	36	24	13	0	0	37	73
280-289	0	27	16	2	0	45	19	20	1	0	40	85
290-299	0	30	14	1	0	45	16	26	1	0	43	88
300-309	0	28	15	0	0	43	24	19	0	0	43	86
310-319	0	30	12	3	0	45	22	26	3	0	51	96
320-329	0	25	11	0	0	36	6	29	3	1	39	75
330-339	0	25	17	1	0	43	8	16	5	0	29	72
340-349	0	15	19	3	0	37	7	17	5	0	29	66
350-359	0	11	9	1	0	21	1	9	5	0	15	36
360-369	0	9	12	1	0	22	1	5	3	0	9	31
370-379	0	6	7	2	0	15	0	3	1	0	4	19
380-389	0	2	7	2	0	11	0	3	2	0	5	16
390-399	0	0	2	3	0	5	0	2	2	0	4	9
400-409	0	1	6	1	0	8	0	2	1	0	3	11
410-419	0	0	4	2	0	6	0	2	0	0	2	8
420-429	0	2	0	2	0	4	0	1	0	0	1	5
430-439	0	4	2	0	0	6	0	1	0	0	1	7
440-449	0	0	2	0	0	2	0	1	1	0	2	4
450-459	0	0	1	1	0	2	0	0	0	0	0	2
460-469	0	2	2	0	0	4	0	0	0	0	0	4
470-479	0	0	0	1	0	1	0	0	1	0	1	2
480-489	0	0	1	1	0	2	0	0	0	0	0	2
490-499	0	0	0	1	0	1	0	0	0	0	0	1
Total	779	388	202	30	0	620	342	221	39	1	603	2002

Table 12. (cont)

Length group (mm)	Immatures (unident.) % 1	Females % of various maturity stages 2	3	4	5	Females Total %	Males % of various maturity stages 2	3	4	5	Males Total %	Per cent of the total
100-109	22.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.59
110-119	23.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.09
120-129	22.59	0.16	0.00	0.00	0.00	0.16	0.83	0.00	0.00	0.00	0.83	9.09
130-139	15.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.84
140-149	9.50	0.00	0.00	0.00	0.00	0.00	0.66	0.00	0.00	0.00	0.66	3.90
150-159	4.36	1.13	0.00	0.00	0.00	1.13	2.65	0.00	0.00	0.00	2.65	2.85
160-169	2.18	2.26	0.00	0.00	0.00	2.26	4.81	0.00	0.00	0.00	4.81	3.00
170-179	0.90	3.55	0.00	0.00	0.00	3.55	5.14	0.00	0.00	0.00	5.14	3.00
180-189	0.00	2.58	0.00	0.00	0.00	2.58	2.65	0.17	0.00	0.00	2.82	1.65
190-199	0.00	1.13	0.00	0.00	0.00	1.13	1.82	0.00	0.00	0.00	1.82	0.90
200-209	0.00	0.16	0.00	0.00	0.00	0.16	1.49	0.17	0.00	0.00	1.66	0.55
210-219	0.00	0.32	0.00	0.00	0.00	0.32	1.00	0.00	0.00	0.00	1.00	0.40
220-229	0.00	0.97	0.16	0.00	0.00	1.13	1.49	0.33	0.00	0.00	1.82	0.90
230-239	0.00	1.77	0.32	0.00	0.00	2.10	0.83	0.17	0.33	0.00	1.33	1.05
240-249	0.00	2.74	0.32	0.00	0.00	3.06	3.98	0.17	0.17	0.00	4.31	2.25
250-259	0.00	3.87	0.97	0.16	0.00	5.00	4.98	1.16	0.00	0.00	6.14	3.40
260-269	0.00	3.55	2.74	0.16	0.00	6.45	3.15	2.16	0.33	0.00	5.64	3.70
270-279	0.00	3.39	2.42	0.00	0.00	5.81	3.98	2.16	0.00	0.00	6.14	3.65
280-289	0.00	4.35	2.58	0.32	0.00	7.26	3.15	3.32	0.17	0.00	6.63	4.25
290-299	0.00	4.84	2.26	0.16	0.00	7.26	2.65	4.31	0.17	0.00	7.13	4.40
300-309	0.00	4.52	2.42	0.00	0.00	6.94	3.98	3.15	0.00	0.00	7.13	4.30
310-319	0.00	4.84	1.94	0.48	0.00	7.26	3.65	4.31	0.50	0.00	8.46	4.80
320-329	0.00	4.03	1.77	0.00	0.00	5.81	1.00	4.81	0.50	0.17	6.47	3.75
330-339	0.00	4.03	2.74	0.16	0.00	6.94	1.33	2.65	0.83	0.00	4.81	3.60
340-349	0.00	2.42	3.06	0.48	0.00	5.97	1.16	2.82	0.83	0.00	4.81	3.30
350-359	0.00	1.77	1.45	0.16	0.00	3.39	0.17	1.49	0.83	0.00	2.49	1.80
360-369	0.00	1.45	1.94	0.16	0.00	3.55	0.17	0.83	0.50	0.00	1.49	1.55
370-379	0.00	0.97	1.13	0.32	0.00	2.42	0.00	0.50	0.17	0.00	0.66	0.95
380-389	0.00	0.32	1.13	0.32	0.00	1.77	0.00	0.50	0.33	0.00	0.83	0.80
390-399	0.00	0.00	0.32	0.48	0.00	0.81	0.00	0.33	0.33	0.00	0.66	0.45
400-409	0.00	0.16	0.97	0.16	0.00	1.29	0.00	0.33	0.17	0.00	0.50	0.55
410-419	0.00	0.00	0.65	0.32	0.00	0.97	0.00	0.33	0.00	0.00	0.33	0.40
420-429	0.00	0.32	0.00	0.32	0.00	0.65	0.00	0.17	0.00	0.00	0.17	0.25
430-439	0.00	0.65	0.32	0.00	0.00	0.97	0.00	0.17	0.00	0.00	0.17	0.35
440-449	0.00	0.00	0.32	0.00	0.00	0.32	0.00	0.17	0.17	0.00	0.33	0.20
450-459	0.00	0.00	0.16	0.16	0.00	0.32	0.00	0.00	0.00	0.00	0.00	0.10
460-469	0.00	0.32	0.32	0.00	0.00	0.65	0.00	0.00	0.00	0.00	0.00	0.20
470-479	0.00	0.00	0.00	0.16	0.00	0.16	0.00	0.00	0.17	0.00	0.17	0.10
480-489	0.00	0.00	0.16	0.16	0.00	0.32	0.00	0.00	0.00	0.00	0.00	0.10
490-499	0.00	0.00	0.00	0.16	0.00	0.16	0.00	0.00	0.00	0.00	0.00	0.05
Total	38.91	62.58	32.58	4.84	0.00	30.97	56.72	36.65	6.47	0.17	30.12	100.00

Table 12. (cont) Lates stappersi. Maturity stage data in July 1993-June 1994.
Frequency distributions and % distributions according to maturity stages.
(All gears combined).

Mpulungu

Number of samples: 100

Year total Length group (mm)	Immatures (unident.) 1	Females Maturity stages 2	3	4	5	Total	Males Maturity stages 2	3	4	5	Total	Total number analysed
100-109	35	0	0	0	0	0	0	0	0	0	0	35
110-119	44	0	0	0	0	0	0	1	0	0	1	45
120-129	32	0	0	0	0	0	0	0	0	0	0	32
130-139	20	0	0	1	0	1	0	1	0	1	2	23
140-149	6	0	0	0	0	0	0	0	0	0	0	6
150-159	6	4	1	1	0	6	5	0	0	0	5	17
160-169	7	6	0	0	0	6	8	2	0	0	10	23
170-179	4	11	4	1	0	16	11	6	1	0	18	38
180-189	8	26	7	4	1	38	29	10	14	0	53	99
190-199	5	61	29	13	3	106	58	22	24	13	117	228
200-209	2	53	44	28	4	129	97	60	44	22	223	354
210-219	1	56	59	87	9	211	87	56	60	38	241	453
220-229	1	56	93	105	9	263	100	77	75	61	313	577
230-239	0	48	100	128	18	294	88	76	69	60	293	587
240-249	1	53	106	178	16	353	88	80	69	72	309	663
250-259	0	51	109	196	30	386	67	82	77	75	301	687
260-269	0	35	90	254	24	403	59	77	114	77	327	730
270-279	0	37	83	238	39	397	59	45	121	98	323	720
280-289	0	40	77	230	56	403	47	48	116	85	296	699
290-299	1	26	51	159	70	306	26	35	97	77	235	542
300-309	0	18	40	150	74	282	18	38	80	62	198	480
310-319	0	12	39	140	82	273	18	32	67	62	179	452
320-329	0	5	25	133	51	214	10	23	78	43	154	368
330-339	0	6	33	108	48	195	8	16	68	51	143	338
340-349	0	1	27	120	36	184	4	11	45	47	107	291
350-359	0	3	19	103	33	158	1	3	47	27	78	236
360-369	0	3	27	93	20	143	6	7	38	26	77	220
370-379	0	2	16	100	23	141	2	3	35	22	62	203
380-389	0	0	9	82	17	108	1	1	37	28	67	175
390-399	0	1	9	66	27	103	1	3	23	21	48	151
400-409	0	0	4	55	19	78	0	3	20	10	33	111
410-419	0	1	3	32	20	56	1	2	10	4	17	73
420-429	0	0	3	30	4	37	0	3	9	9	21	58
430-439	0	1	0	8	4	13	0	1	3	2	6	19
440-449	0	1	0	6	1	8	0	0	2	0	2	10
450-459	0	1	0	0	0	1	0	0	1	0	1	2
460-469	0	0	0	0	0	0	0	0	0	0	0	0
470-479	0	0	0	0	0	0	0	0	0	0	0	0
480-489	0	0	0	1	1	2	0	0	0	0	0	2
490-499	0	0	0	0	0	0	0	0	0	0	0	0
Total	173	618	1107	2850	739	5314	899	824	1444	1093	4260	9747

Table 12. (cont)

Length group (mm)	Immatures (unident.) %	Females % of various maturity stages				Females Total %	Males % of various maturity stages				Males Total %	Per cent of the total
	1	2	3	4	5		2	3	4	5		
100-109	20.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.36
110-119	25.43	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.02	0.46
120-129	18.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33
130-139	11.56	0.00	0.00	0.02	0.00	0.02	0.00	0.02	0.00	0.02	0.05	0.24
140-149	3.47	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06
150-159	3.47	0.08	0.02	0.02	0.00	0.11	0.12	0.00	0.00	0.00	0.12	0.17
160-169	4.05	0.11	0.00	0.00	0.00	0.11	0.19	0.05	0.00	0.00	0.23	0.24
170-179	2.31	0.21	0.08	0.02	0.00	0.30	0.26	0.14	0.02	0.00	0.42	0.39
180-189	4.62	0.49	0.13	0.08	0.02	0.72	0.68	0.23	0.33	0.00	1.24	1.02
190-199	2.89	1.15	0.55	0.24	0.06	1.99	1.36	0.52	0.56	0.31	2.75	2.34
200-209	1.16	1.00	0.83	0.53	0.08	2.43	2.28	1.41	1.03	0.52	5.23	3.63
210-219	0.58	1.05	1.11	1.64	0.17	3.97	2.04	1.31	1.41	0.89	5.66	4.65
220-229	0.58	1.05	1.75	1.98	0.17	4.95	2.35	1.81	1.76	1.43	7.35	5.92
230-239	0.00	0.90	1.88	2.41	0.34	5.53	2.07	1.78	1.62	1.41	6.88	6.02
240-249	0.58	1.00	1.99	3.35	0.30	6.64	2.07	1.88	1.62	1.69	7.25	6.80
250-259	0.00	0.96	2.05	3.69	0.56	7.26	1.57	1.92	1.81	1.76	7.07	7.05
260-269	0.00	0.66	1.69	4.78	0.45	7.58	1.38	1.81	2.68	1.81	7.68	7.49
270-279	0.00	0.70	1.56	4.48	0.73	7.47	1.38	1.06	2.84	2.30	7.58	7.39
280-289	0.00	0.75	1.45	4.33	1.05	7.58	1.10	1.13	2.72	2.00	6.95	7.17
290-299	0.58	0.49	0.96	2.99	1.32	5.76	0.61	0.82	2.28	1.81	5.52	5.56
300-309	0.00	0.34	0.75	2.82	1.39	5.31	0.42	0.89	1.88	1.46	4.65	4.92
310-319	0.00	0.23	0.73	2.63	1.54	5.14	0.42	0.75	1.57	1.46	4.20	4.64
320-329	0.00	0.09	0.47	2.50	0.96	4.03	0.23	0.54	1.83	1.01	3.62	3.78
330-339	0.00	0.11	0.62	2.03	0.90	3.67	0.19	0.38	1.60	1.20	3.36	3.47
340-349	0.00	0.02	0.51	2.26	0.68	3.46	0.09	0.26	1.06	1.10	2.51	2.99
350-359	0.00	0.06	0.36	1.94	0.62	2.97	0.02	0.07	1.10	0.63	1.83	2.42
360-369	0.00	0.06	0.51	1.75	0.38	2.69	0.14	0.16	0.89	0.61	1.81	2.26
370-379	0.00	0.04	0.30	1.88	0.43	2.65	0.05	0.07	0.82	0.52	1.46	2.08
380-389	0.00	0.00	0.17	1.54	0.32	2.03	0.02	0.02	0.87	0.66	1.57	1.80
390-399	0.00	0.02	0.17	1.24	0.51	1.94	0.02	0.07	0.54	0.49	1.13	1.55
400-409	0.00	0.00	0.08	1.04	0.36	1.47	0.00	0.07	0.47	0.23	0.77	1.14
410-419	0.00	0.02	0.06	0.60	0.38	1.05	0.02	0.05	0.23	0.09	0.40	0.75
420-429	0.00	0.00	0.06	0.56	0.08	0.70	0.00	0.07	0.21	0.21	0.49	0.60
430-439	0.00	0.02	0.00	0.15	0.08	0.24	0.00	0.02	0.07	0.05	0.14	0.19
440-449	0.00	0.02	0.00	0.11	0.02	0.15	0.00	0.00	0.05	0.00	0.05	0.10
450-459	0.00	0.02	0.00	0.00	0.00	0.02	0.00	0.00	0.02	0.00	0.02	0.02
460-469	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
470-479	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
480-489	0.00	0.00	0.00	0.02	0.02	0.04	0.00	0.00	0.00	0.00	0.00	0.02
490-499	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	1.77	11.63	20.83	53.63	13.91	54.52	21.10	19.34	33.90	25.66	43.71	100.00

Table 13. Annual catch composition (%) of Limnothrissa miodon in various gears (weekly samples pooled)

	Bujumbura	Uvira	Kigoma	Kipili	Bujumbura	Kigoma	Kipili	Mpulungu	Kigoma	Kipili	Mpulungu
	Liftnet	Liftnet	Liftnet	Liftnet	Beach seine	Beach seine	Beach seine	Beach seine	Purse seine	Purse seine	Purse seine
Length group (mm)											
10-19	0.02	0.00	0.00	0.00	0.00	0.00	0.00	2.75	0.00	0.00	0.00
20-29	0.74	0.00	0.00	0.00	0.00	0.00	0.00	34.04	0.00	0.00	3.19
30-39	7.96	0.00	0.12	0.74	0.00	0.00	3.11	17.40	0.00	0.05	18.58
40-49	15.74	0.00	0.00	2.29	0.00	0.00	2.54	9.13	0.00	0.00	16.68
50-59	17.12	0.03	0.00	10.23	0.00	0.00	9.12	10.01	0.00	0.00	5.67
60-69	22.10	0.25	0.00	15.21	0.00	0.00	18.06	10.29	0.00	0.00	8.70
70-79	12.32	0.34	0.00	16.70	1.55	0.00	24.54	8.18	0.00	0.00	3.32
80-89	10.25	4.78	1.09	21.24	3.94	4.26	29.61	4.17	0.00	0.68	3.87
90-99	10.39	27.79	3.02	20.55	21.13	8.51	8.68	2.97	0.29	2.82	3.32
100-109	2.77	35.89	35.27	10.07	39.15	19.15	2.84	0.84	5.69	19.30	6.74
110-119	0.38	22.76	43.36	2.14	23.38	23.40	1.15	0.11	12.15	24.27	7.34
120-129	0.16	7.60	12.44	0.54	8.17	29.79	0.23	0.06	26.71	20.61	9.02
130-139	0.04	0.56	3.86	0.19	1.83	12.77	0.10	0.03	27.97	17.10	9.02
140-149	0.01	0.00	0.72	0.04	0.42	2.13	0.02	0.00	18.32	10.30	3.35
150-159	0.00	0.00	0.12	0.06	0.42	0.00	0.01	0.03	7.14	3.92	0.97
160-169	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.74	0.94	0.24
170-179	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Number of samples	145	42	43	49	16	1	32	71	13	57	26

Table 14. **Annual catch composition (%) of Stolothrissa tanganicae in various gears (weekly samples pooled)**

	Bujumbura	Uvira	Kalemie	Kigoma	Kipili	Kipili	Mpulungu	Kigoma	Mpulungu
	Liftnet	Liftnet	Liftnet	Liftnet	Liftnet	Beach seine	Beach seine	Purse seine	Purse seine
Length group (mm)									
10-19	0.00	0.00	0.00	0.00	0.00	0.00	3.57	0.00	0.00
20-29	1.14	0.17	0.20	0.00	0.00	0.00	14.94	0.00	0.00
30-39	7.70	4.68	3.08	0.55	0.00	0.54	18.66	0.00	0.52
40-49	29.38	19.51	9.73	3.09	0.18	14.13	32.64	0.44	3.00
50-59	21.27	13.94	10.89	8.49	3.79	26.65	2.01	0.66	23.16
60-69	22.96	21.68	16.28	17.10	16.61	33.38	0.96	4.15	27.08
70-79	11.72	24.59	27.03	31.26	28.88	13.19	10.08	25.09	6.69
80-89	5.07	10.56	23.85	33.55	20.76	10.90	5.46	47.95	12.94
90-99	0.73	4.24	8.09	5.85	22.02	1.21	5.06	20.37	9.62
100-109	0.03	0.62	0.85	0.11	7.22	0.00	6.04	1.35	15.10
110-119	0.00	0.01	0.00	0.00	0.54	0.00	0.56	0.00	1.88
120-129	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
130-139	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
140-149	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
150-159	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
160-169	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
170-179	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Number of samples	172	55	27	106	11	6	26	15	17

Table 14. Annual catch composition (%) of Stolothrissa tanganicae in various gears (weekly samples pooled)

	Bujumbura	Uvira	Kalemie	Kigoma	Kipili	Kipili	Mpulungu	Kigoma	Mpulungu
	Liftnet	Liftnet	Liftnet	Liftnet	Liftnet	Beach seine	Beach seine	Purse seine	Purse seine
Length group (mm)	Bujumbura	Uvira	Kalemie	Kigoma	Kipili	Kipili	Mpulungu	Kigoma	Mpulungu
10-19							3.57		
20-29	1.14	0.17	0.20				14.94		
30-39	7.70	4.68	3.08	0.55		0.54	18.66		0.52
40-49	29.38	19.51	9.73	3.09	0.18	14.13	32.64	0.44	3.00
50-59	21.27	13.94	10.89	8.49	3.79	26.65	2.01	0.66	23.16
60-69	22.96	21.68	16.28	17.10	16.61	33.38	0.96	4.15	27.08
70-79	11.72	24.59	27.03	31.26	28.88	13.19	10.08	25.09	6.69
80-89	5.07	10.56	23.85	33.55	20.76	10.90	5.46	47.95	12.94
90-99	0.73	4.24	8.09	5.85	22.02	1.21	5.06	20.37	9.62
100-109	0.03	0.62	0.85	0.11	7.22		6.04	1.35	15.10
110-119		0.01			0.54		0.56		1.88
120-129									
130-139									
140-149									
150-159									
160-169									
170-179									
Number of samples	172	55	27	106	11	6	26	15	17

Table 15. Annual catch composition (%) of Lates stappersi in various gears (weekly samples pooled)

	Bujumbura	Uvira	Moba	Kigoma	Kipili	Kigoma	Mpulungu
	Liftnet	Liftnet	Liftnet	Liftnet	Liftnet	Purse seine	Purse seine
Length group (mm)							
10-19	0.04	0.00	0.00	0.00	0.00	0.00	0.00
20-29	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30-39	0.77	0.89	0.00	0.00	0.00	0.00	0.00
40-49	1.61	1.38	0.00	0.00	0.00	0.00	0.00
50-59	1.65	2.18	0.00	0.40	0.65	0.24	0.00
60-69	15.81	7.65	0.00	2.18	3.07	0.89	0.00
70-79	14.89	13.92	0.00	3.07	14.34	0.13	0.00
80-89	8.25	24.38	0.00	6.04	5.42	1.26	0.01
90-99	19.69	18.02	0.00	13.17	2.93	5.53	0.31
100-109	20.64	15.26	0.00	12.72	2.17	14.44	1.04
110-119	7.98	10.77	0.00	13.12	1.26	13.02	0.95
120-129	1.84	4.31	0.00	10.54	0.07	17.69	0.23
130-139	0.84	0.67	0.00	4.50	0.00	9.74	0.15
140-149	0.50	0.18	0.00	1.78	0.04	3.54	0.05
150-159	0.15	0.04	0.00	2.87	0.14	0.67	0.09
160-169	0.00	0.04	0.00	3.32	0.25	0.48	0.19
170-179	0.19	0.00	0.00	2.77	0.69	1.40	0.28
180-189	0.12	0.00	14.20	0.74	1.05	1.10	0.92
190-199	0.04	0.00	35.01	0.54	1.63	0.46	2.43
200-209	0.12	0.00	37.39	0.30	2.06	0.32	4.45
210-219	0.23	0.00	13.12	0.15	2.31	0.24	5.90
220-229	0.23	0.04	0.28	0.50	2.38	0.38	7.45
230-239	0.27	0.00	0.00	0.40	2.64	0.43	7.73
240-249	0.38	0.00	0.00	1.63	2.93	0.89	8.08
250-259	0.04	0.00	0.00	1.44	3.97	1.96	9.21
260-269	0.15	0.00	0.00	1.24	4.44	1.74	9.60
270-279	0.12	0.00	0.00	0.89	4.41	2.20	9.04
280-289	0.15	0.00	0.00	1.29	3.61	2.31	6.71
290-299	0.31	0.00	0.00	1.78	3.68	2.98	4.61
300-309	0.42	0.00	0.00	2.13	4.33	2.50	3.51
310-319	0.58	0.04	0.00	2.03	3.61	2.15	2.73
320-329	0.61	0.04	0.00	1.93	4.62	2.63	2.44
330-339	0.46	0.00	0.00	1.44	3.58	2.04	2.31
340-349	0.42	0.09	0.00	1.44	3.32	2.28	1.86
350-359	0.31	0.09	0.00	0.79	1.99	1.02	1.73
360-369	0.12	0.00	0.00	0.69	2.56	0.99	1.33
370-379	0.04	0.00	0.00	0.50	2.35	0.64	1.20
380-389	0.00	0.00	0.00	0.84	2.53	0.46	1.06
390-399	0.04	0.00	0.00	0.10	2.17	0.27	0.83
400-409	0.00	0.00	0.00	0.10	1.48	0.27	0.68
410-419	0.00	0.00	0.00	0.25	0.69	0.03	0.38
420-429	0.00	0.00	0.00	0.20	0.07	0.05	0.26
430-439	0.00	0.00	0.00	0.00	0.25	0.08	0.13
440-449	0.00	0.00	0.00	0.00	0.22	0.13	0.08
450-459	0.00	0.00	0.00	0.05	0.07	0.03	0.01
460-469	0.00	0.00	0.00	0.05	0.00	0.13	0.02
470-479	0.00	0.00	0.00	0.10	0.04	0.11	0.01
480-489	0.00	0.00	0.00	0.00	0.00	0.05	0.01
490-499	0.00	0.00	0.00	0.00	0.00	0.03	0.00
500-509	0.00	0.00	0.00	0.00	0.00	0.00	0.00
510-519	0.00	0.00	0.00	0.00	0.00	0.00	0.00
520-529	0.00	0.00	0.00	0.00	0.00	0.00	0.00
530-539	0.00	0.00	0.00	0.00	0.00	0.00	0.00
540-549	0.00	0.00	0.00	0.00	0.00	0.00	0.00
550-559	0.00	0.00	0.00	0.00	0.00	0.03	0.00
560-569	0.00	0.00	0.00	0.00	0.00	0.03	0.00
570-579	0.00	0.00	0.00	0.00	0.00	0.00	0.00
580-589	0.00	0.00	0.00	0.00	0.00	0.00	0.00
590-599	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Number of samples	65	11	2	61	124	27	98

Table 15a. **Annual catch composition (%) of Lates stappersii in various gears (weekly samples pooled)**

	Bujumbura	Uvira	Moba	Kigoma	Kipili	Kigoma	Mpulungu
	Liftnet Bujumbura	Liftnet Uvira	Liftnet Moba	Liftnet Kigoma	Liftnet Kipili	Purse seine Kigoma	Purse seine Mpulungu
10-19	0.04						
20-29							
30-39	0.77	0.89					
40-49	1.61	1.38					
50-59	1.65	2.18		0.40	0.65	0.24	
60-69	15.81	7.65		2.18	3.07	0.89	
70-79	14.89	13.92		3.07	14.34	0.13	
80-89	8.25	24.38		6.04	5.42	1.26	0.01
90-99	19.69	18.02		13.17	2.93	5.53	0.31
100-109	20.64	15.26		12.72	2.17	14.44	1.04
110-119	7.98	10.77		13.12	1.26	13.02	0.95
120-129	1.84	4.31		10.54	0.07	17.69	0.23
130-139	0.84	0.67		4.50	0.00	9.74	0.15
140-149	0.50	0.18		1.78	0.04	3.54	0.05
150-159	0.15	0.04		2.87	0.14	0.67	0.09
160-169		0.04		3.32	0.25	0.48	0.19
170-179	0.19			2.77	0.69	1.40	0.28
180-189	0.12		14.20	0.74	1.05	1.10	0.92
190-199	0.04		35.01	0.54	1.63	0.46	2.43
200-209	0.12		37.39	0.30	2.06	0.32	4.45
210-219	0.23		13.12	0.15	2.31	0.24	5.90
220-229	0.23	0.04	0.28	0.50	2.38	0.38	7.45
230-239	0.27			0.40	2.64	0.43	7.73
240-249	0.38			1.63	2.93	0.89	8.08
250-259	0.04			1.44	3.97	1.96	9.21
260-269	0.15			1.24	4.44	1.74	9.60
270-279	0.12			0.89	4.41	2.20	9.04
280-289	0.15			1.29	3.61	2.31	6.71
290-299	0.31			1.78	3.68	2.98	4.61
300-309	0.42			2.13	4.33	2.50	3.51
310-319	0.58	0.04		2.03	3.61	2.15	2.73
320-329	0.61	0.04		1.93	4.62	2.63	2.44
330-339	0.46			1.44	3.58	2.04	2.31
340-349	0.42	0.09		1.44	3.32	2.28	1.86
350-359	0.31	0.09		0.79	1.99	1.02	1.73
360-369	0.12			0.69	2.56	0.99	1.33
370-379	0.04			0.50	2.35	0.64	1.20
380-389				0.84	2.53	0.46	1.06
390-399	0.04			0.10	2.17	0.27	0.83
400-409				0.10	1.48	0.27	0.68
410-419				0.25	0.69	0.03	0.38
420-429				0.20	0.07	0.05	0.26
430-439					0.25	0.08	0.13
440-449					0.22	0.13	0.08
450-459				0.05	0.07	0.03	0.01
460-469				0.05	0.00	0.13	0.02
470-479				0.10	0.04	0.11	0.01
480-489						0.05	0.01
490-499						0.03	
500-509							
510-519							
520-529							
530-539							
540-549							
550-559						0.03	
560-569						0.03	
570-579							
580-589							
590-599							
Number of samples	65	11	2	61	124	27	98

Table 16. Maturity ogive (%) of Limnothrissa miodon, Stolthrissa tanganicae and Lates stappersi according to length groups in Lake tanganyika. Data from June 1993-July 1994.

Limnothrissa miodon

Length group (mm)	Maturity ogive %		
	Immatures	Females	Males
20-24	100	0	0
25-29	100	0	0
30-34	100	0	0
35-39	100	0	0
40-44	100	0	0
45-49	99	0	0
50-54	100	0	0
55-59	98	0	1
60-64	96	0	1
65-69	81	2	7
70-74	52	6	22
75-79	20	14	41
80-84	6	27	58
85-89	4	40	72
90-94	4	56	83
95-99	3	72	91
100-104	3	83	95
105-109	3	90	98
110-114	3	94	99
115-119	0	96	99
120-124	4	98	99
125-129	0	99	100
130-134	0	99	100
135-139	0	100	100
>140	0	100	100

Stolothrissa tanganicae

Length group (mm)	Maturity ogive %		
	Immatures	Females	Males
20-24	100	0	0
25-29	100	0	0
30-34	100	0	0
35-39	100	0	0
40-44	100	0	0
45-49	99	0	0
50-54	100	0	0
55-59	98	2	1
60-64	96	5	4
65-69	81	17	19
70-74	52	34	46
75-79	20	57	69
80-84	6	74	83
85-89	4	86	91
90-94	4	94	97
95-99	3	98	100
100-104	3	100	100
105-109	3	100	100
>110	0	100	100

Lates stappersi

Length group (mm)	Maturity ogive %		
	Immatures	Females	Males
100-109	100	0	0
110-119	100	0	0
120-129	100	0	0
130-139	100	0	0
140-149	100	1	1
150-159	99	1	1
160-169	100	1	2
170-179	98	2	3
180-189	96	3	4
190-199	81	5	7
200-209	52	7	12
210-219	20	11	17
220-229	6	15	24
230-239	4	20	30
240-249	4	27	37
250-259	3	34	44
260-269	3	41	51
270-279	3	48	58
280-289	3	56	65
290-299	0	61	71
300-309	4	67	76
310-319	0	72	80
320-329	0	76	84
330-339	0	80	88
340-349	0	84	91
350-359	0	87	93
360-369	0	90	94
370-379	0	92	96
380-389	0	94	97
390-399	0	96	98
400-409	0	98	99
410-419	0	99	99
420-429	0	99	100
>430	0	100	100

Table 17a. Estimates of growth parameters by species.

	Estimation method	*Limnothrissa miodon* Observed TL(max)	L (infinity) (mm)	K	T(zero)	*Stolothrissa tanganicae* Observed TL(max)	L (infinity) (mm)	K	T(zero)	*Lates stappersi* Observed TL(max)	L (infinity) (mm)	K	T(zero)
Sampling area													
Uvira (Zaire)	ELEFAN I	-	-	-	-	115	114	2.78	-0.10	-	-	-	-
Bujumbura and Karonda (Burundi)	ELEFAN I	152	184	0.89	-0.21	115	114	2.47	-0.28	-	-	-	-
Kigoma (Tanzania)	ELEFAN I	-	-	-	-	106	110	1.71	-0.49	545	540	0.46	-0.54
	SLCA					-	-	-	-	545	593	0.43	-0.48
	Projection matrix					-	-	-	-	545	575	0.56	-0.26
Kipili (Tanzania)	ELEFAN I	157	187	0.87	-0.32	-	-	-	-	475	569	0.37	-0.65
	SLCA					-	-	-	-	475	593	0.36	-0.69
Mpulungu (Zambia)	ELEFAN I	161	189	0.81	-0.08	115	119	2.48	-0.05	488	540	0.42	-0.57
	SLCA					-	-	-	-	488	529	0.39	-0.84

Table 17b. Estimates of growth parameters by species.

Stolothrissa tanganicae					
Area	**Observed TLmax**	**Method**	**Asymptotic TL (Loo, mm)**	**Growth constant (K , annual)**	**Phi prime**
Zaire (Uvira)	115	ELEFAN I	110	2.47	4.48
Burundi (Bujumbura)	108	ELEFAN I	114	2.08	4.44
Burundi (Karonda)	115	ELEFAN I	111	1.90	4.37
Tanzania (Kigoma)	106	ELEFAN I	100	1.85	4.27
Zambia (Mpulungu)	115	ELEFAN I	110	2.00	4.38
Limnothrissa miodon					
Area	**Observed TLmax**	**Method**	**Asymptotic TL (Loo, mm)**	**Growth constant (K , annual)**	**Phi prime**
Burundi (Bujumbura)	152	ELEFAN I	176	0.86	4.43
Tanzania (Kipili)	157	ELEFAN I	175	1.16	4.55
Zambia (Mpulungu)	161	ELEFAN I	178	0.84	4.42
Lates stappersi					
Area	**Observed TLmax**	**Method**	**Asymptotic TL (Loo, mm)**	**Growth constant (K , annual)**	**Phi prime**
Tanzania (Kigoma)	545	ELEFAN I	582	0.43	5.16
" "	"	SLCA	604	0.41	5.17
" "	"	Proj. Matrix	586	0.35	5.08
Tanzania (Kipili)	475	ELEFAN I	595	0.30	5.03
" "	"	SLCA	578	0.32	5.03
Zambia (Mpulungu)	488	ELEFAN I	589	0.37	5.10
" "	"	SLCA	545	0.38	5.05

Table 18a. Estimates of total mortality rates by species.

Limnothrissa miodon

Sampling area	Estimation method	Length groups used	Length at first capture (mm)	Z (annual)	Z (month)	M (annual)	F (annual)	E (annual)
Uvira (Zaire)	ELEFAN I	-	-	-	-	-	-	-
Bujumbura and Karonda (Burundi)	ELEFAN I	20-169	50	3.08	0.26	0.98	2.10	0.68
Kigoma (Tanzania)	ELEFAN I	-	-	-	-	-	-	-
	SLCA	-	-	-	-	-	-	-
	Projection matrix	-	-	-	-	-	-	-
Kipili (Tanzania)	ELEFAN I	20-169	60	3.89	0.32	0.96	2.93	0.75
	SLCA	-	-	-	-	-	-	-
Mpulungu (Zambia)	ELEFAN I	10-179	20	4.44	0.37	0.91	3.53	0.80
	SLCA	-	-	-	-	-	-	-

Stolothrissa tanganicae

Sampling area	Estimation method	Length groups used	Length at first capture (mm)	Z (annual)	Z (month)	M (annual)	F (annual)	E (annual)
Uvira (Zaire)	ELEFAN I	20-129	40.0	6.02	0.50	2.36	3.66	0.61
Bujumbura and Karonda (Burundi)	ELEFAN I	20-119	40.0	6.94	0.58	2.18	4.76	0.69
Kigoma (Tanzania)	ELEFAN I	-	-	-	-	-	-	-
	SLCA	-	-	-	-	-	-	-
	Projection matrix	20-119	80.0	6.30	0.53	1.73	4.57	0.73
Kipili (Tanzania)	ELEFAN I			-	-	-	-	-
	SLCA	-	-	-	-	-	-	-
Mpulungu (Zambia)	ELEFAN I	20-129	40.0	5.53	0.46	2.16	3.37	0.61
	SLCA	-	-	-	-	-	-	-

Lates stappersi

Sampling area	Estimation method	Length groups used	Length at first capture (mm)	Z (annual)	Z (month)	M (annual)	F (annual)	E (annual)
Uvira (Zaire)	ELEFAN I	-	-	-	-	-	-	-
Bujumbura and Karonda (Burundi)	ELEFAN I	-	-	-	-	-	-	-
Kigoma (Tanzania)	ELEFAN I	50-510	90.0	2.65	0.22	0.47	2.18	0.82
	SLCA	50-510	90.0	2.59	0.21	0.44	2.15	0.83
	Projection matrix	50-510	90.0	2.12	0.18	0.53	1.59	0.75
Kipili (Tanzania)	ELEFAN I	50-509	90.0	0.90	0.08	0.40	0.50	0.56
	SLCA	50-509	90.0	0.93	0.08	0.39	0.54	0.58
Mpulungu (Zambia)	ELEFAN I	50-509	90.0	0.64	0.05	0.44	0.20	0.31
	SLCA	50-509	90.0	0.57	0.05	0.43	0.14	0.25

Table 18b. **Estimates of mortality parameters. Latin numbers refer to methods used in computation. I) Pauly (1983), II) Beverton and Holt (1956), III) Hoenig in Gayanilo et al. (in press) IV) Pauly (1980), V) Rikhter and Efanov (1976), VI) Gunderson and Dygert (1988), VII) and VIII) Alagaraya (1984).**

Limnothrissa miodon								
	Total mortality (Z, annual)			Natural mortality (M, annual)				
Area	**I**	**II**	**III**	**IV**	**V**	**VI**	**VII**	**VIII**
Burundi (Bujumbura)	4.27	3.89	3.51	1.78	1.79	0.98	1.84	2.76
Tanzania (Kipili)	6.28	6.00	4.74	2.16	1.81	1.30	2.30	3.45
Zambia (Mpulungu)	4.12	3.29	3.74	1.75	1.81	0.96	2.21	3.32
Stolothrissa tanganicae								
	Total mortality (Z, annual)			Natural mortality (M, annual)				
Area	**I**	**II**	**III**	**IV**	**V**	**VI**	**VII**	**VIII**
Zaire (Uvira)	6.32	7.41	6.24	4.05	2.18	2.69	3.07	4.61
Burundi (Bujumbura)	7.83	10.50	6.35	3.58	2.10	2.27	3.29	4.93
Burundi (Karonda)	4.23	6.28	3.74	3.40	2.10	2.08	2.09	3.14
Tanzania (Kigoma)	4.60	4.32	5.84	3.44	1.63	2.03	2.30	3.45
Zambia (Mpulungu)				3.53	2.10	2.19	3.07	4.61
Lates stappersi								
	Total mortality (Z, annual)			Natural mortality (M, annual)				
Area	**I**	**II**	**III**	**IV**	**V**	**VI**	**VII**	**VIII**
Tanzania (Kigoma)	1.98	1.93	1.29	0.81	1.04	0.53	0.77	1.15
SLCA VBGF parameters	1.61	1.94	1.54	0.78	1.04	0.50	0.77	1.15
Projmat VBGF paramet.	1.66	1.58	2.03	0.71	0.86	0.44	0.71	1.06
Tanzania (Kipili)	1.89	1.30	2.03	0.64	0.80	0.39	0.84	1.26
SLCA VBGF parameters	1.87	1.30	2.03	0.67	0.80	0.41	0.84	1.26
Zambia (Mpulungu)	2.58	2.70	2.03	0.73	0.94	0.46	0.92	1.38
SLCA VBGF parameters	2.31	2.35	1.71	0.79	0.86	0.47	0.77	1.15

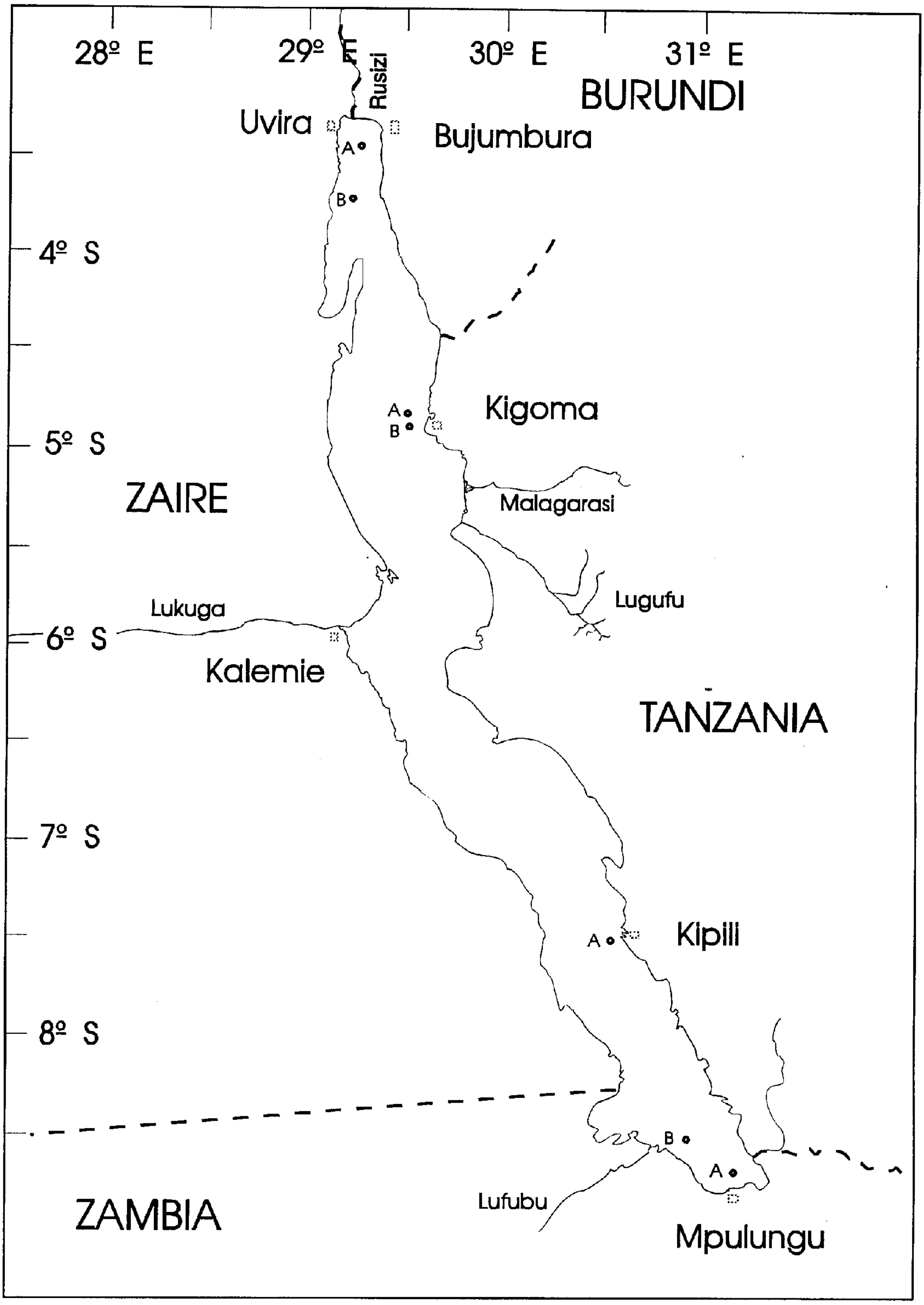


Figure 1: Lake Tanganyika research stations and substations

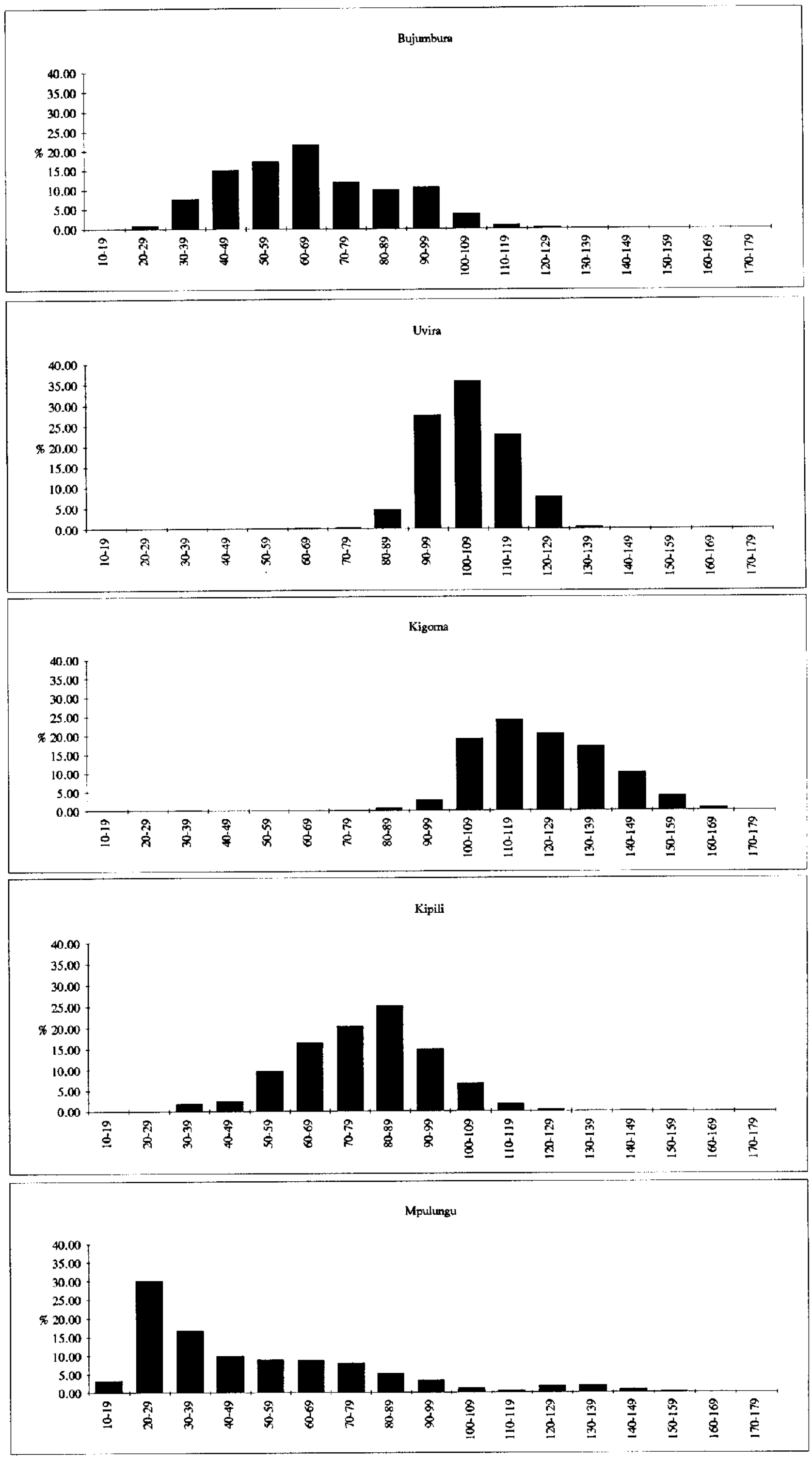
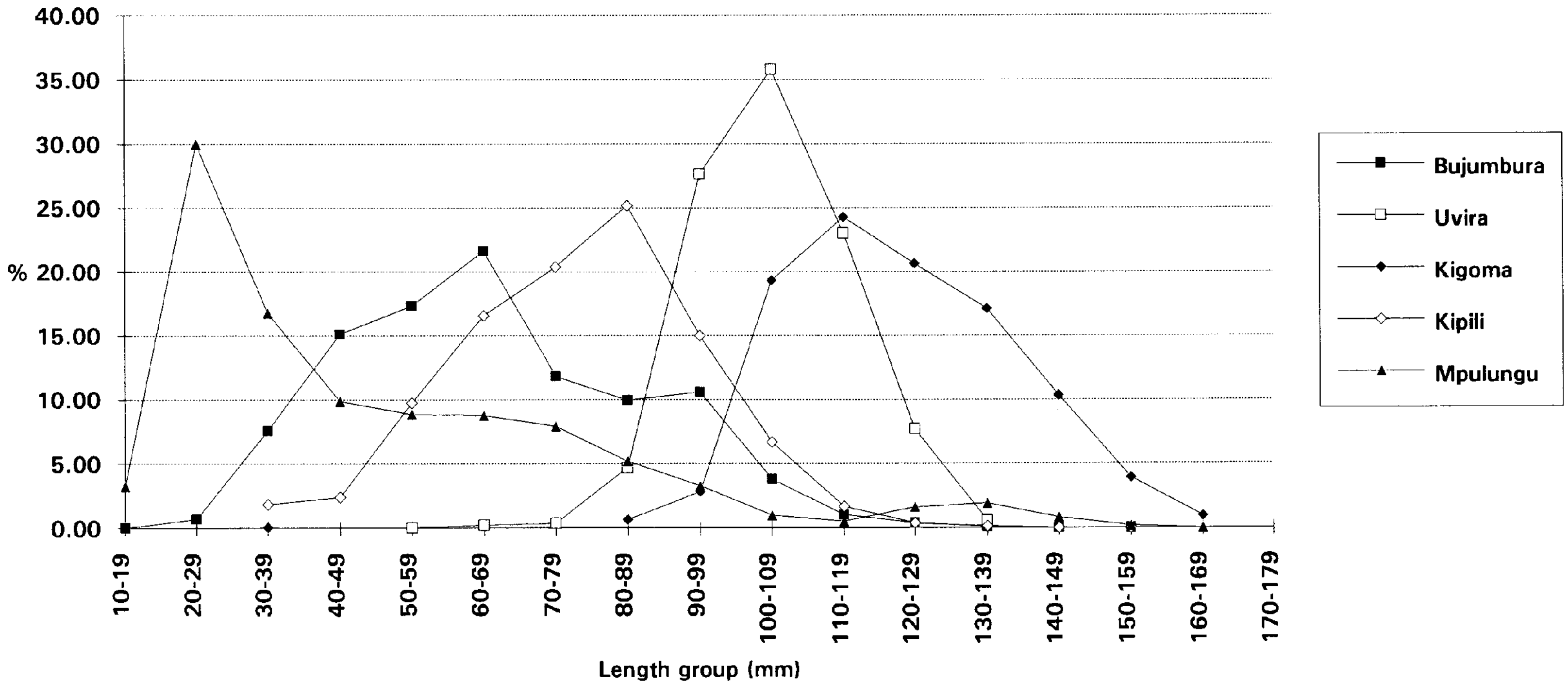


Figure 2. Total annual catch composition (%) of Limnothrissa miodon according to length groups (mm) in various sampling stations (all gears combined).

Figure 2. Total annual catch composition of Limnothrissa miodon in various sampling stations (all gears combined).



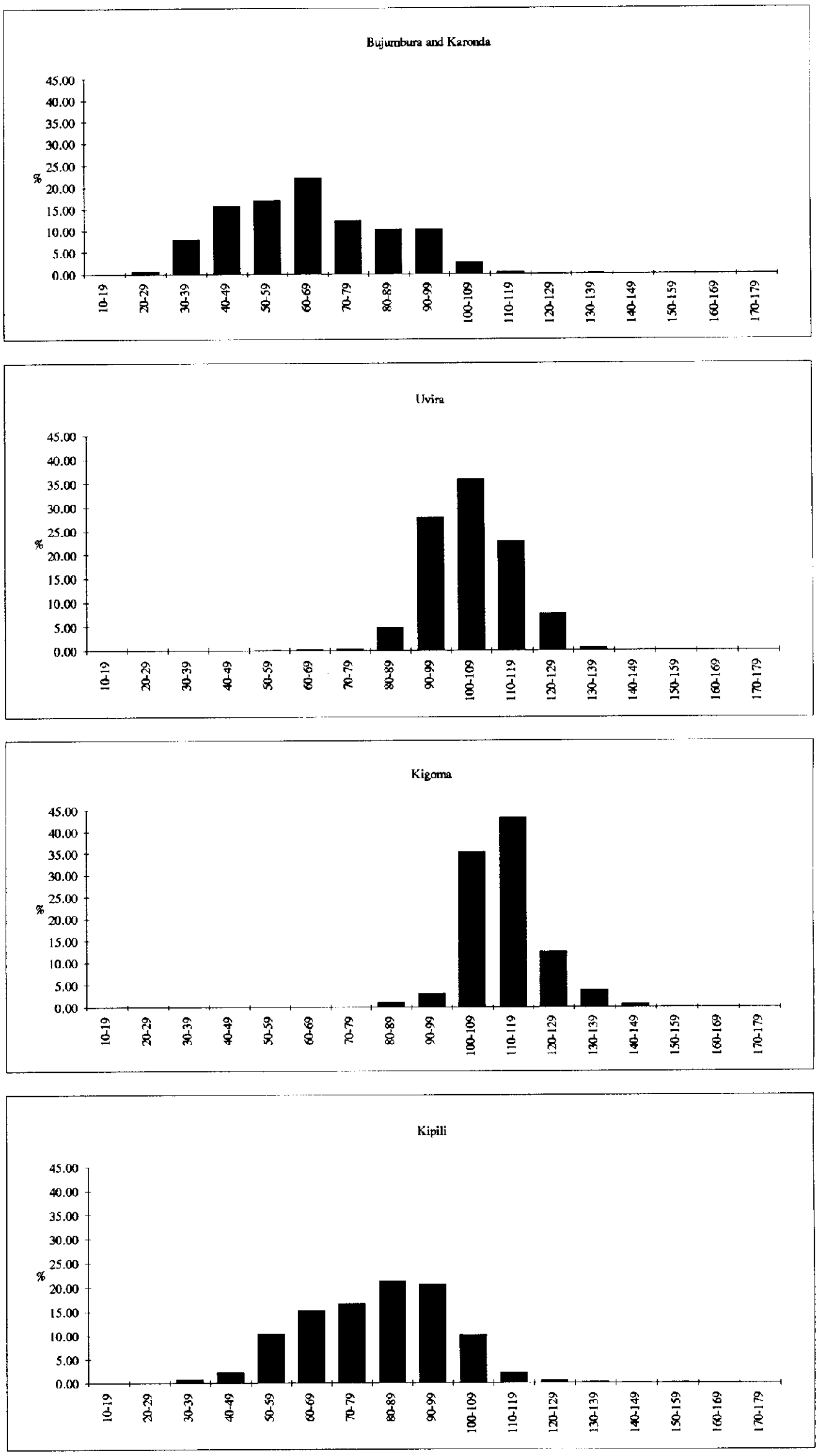
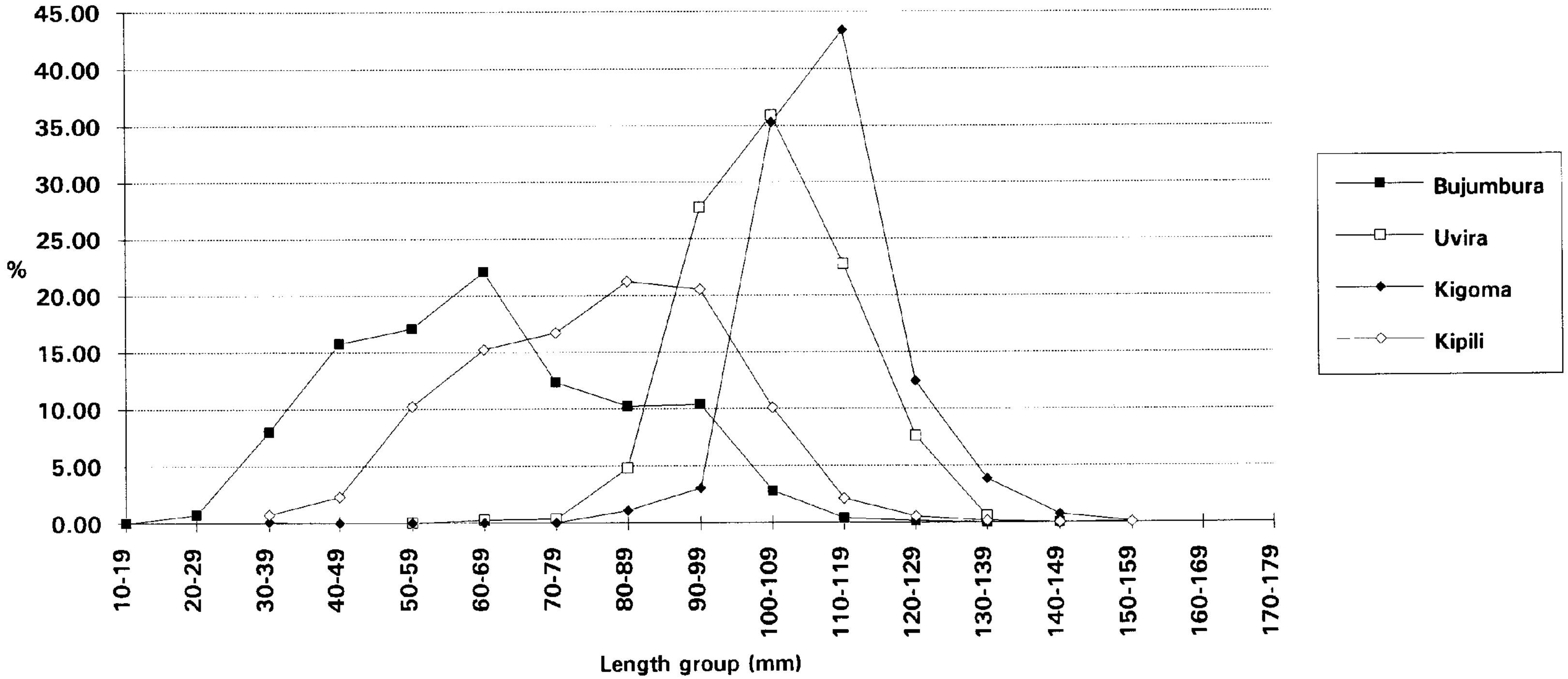


Figure 3. Total annual lift net catch composition (%) of Limnothrissa miodon according to length groups (mm) in various sampling stations.

Figure 3.Total annual lift net catch composition of Limnothrissa miodon in various sampling stations.



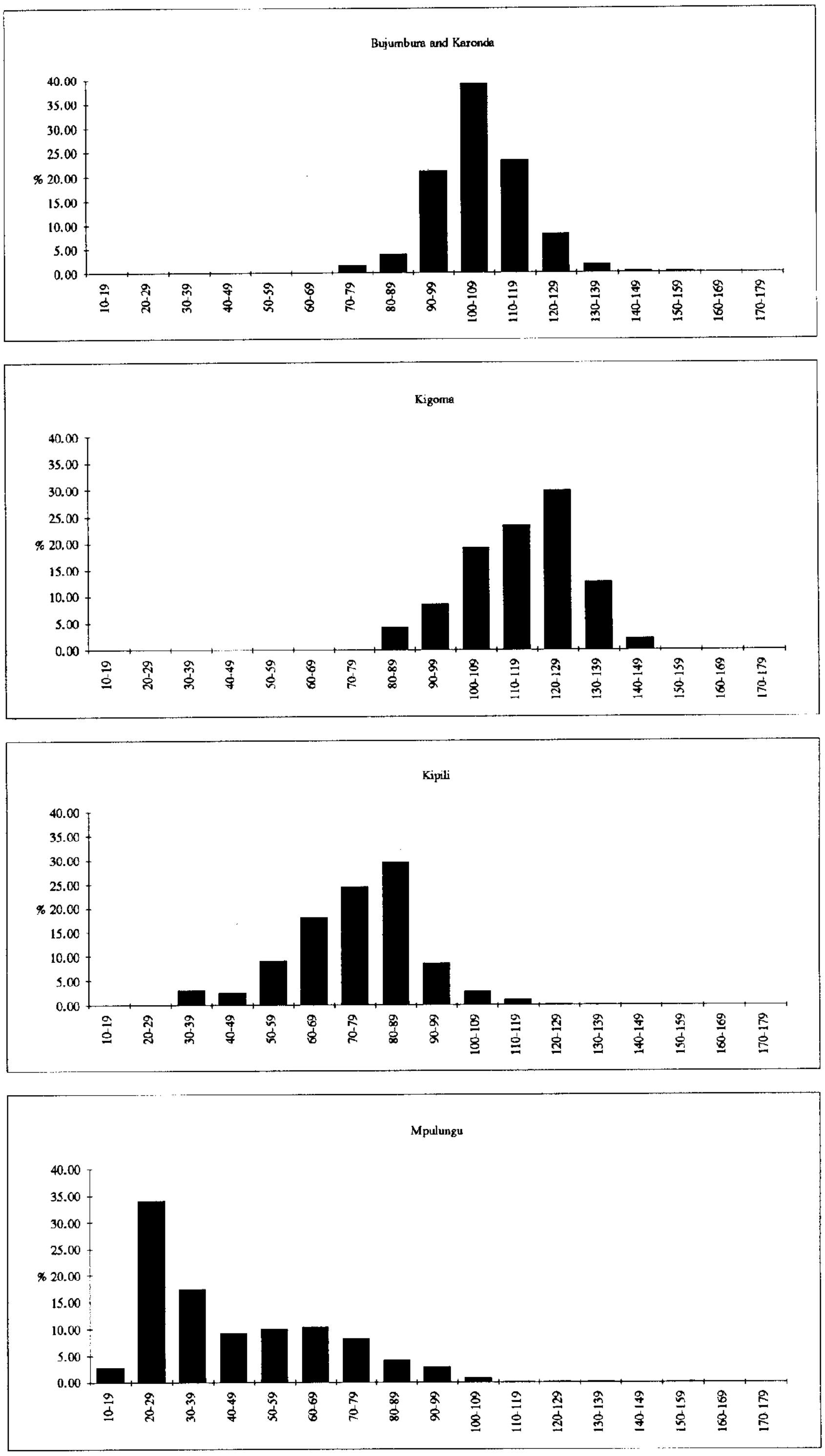
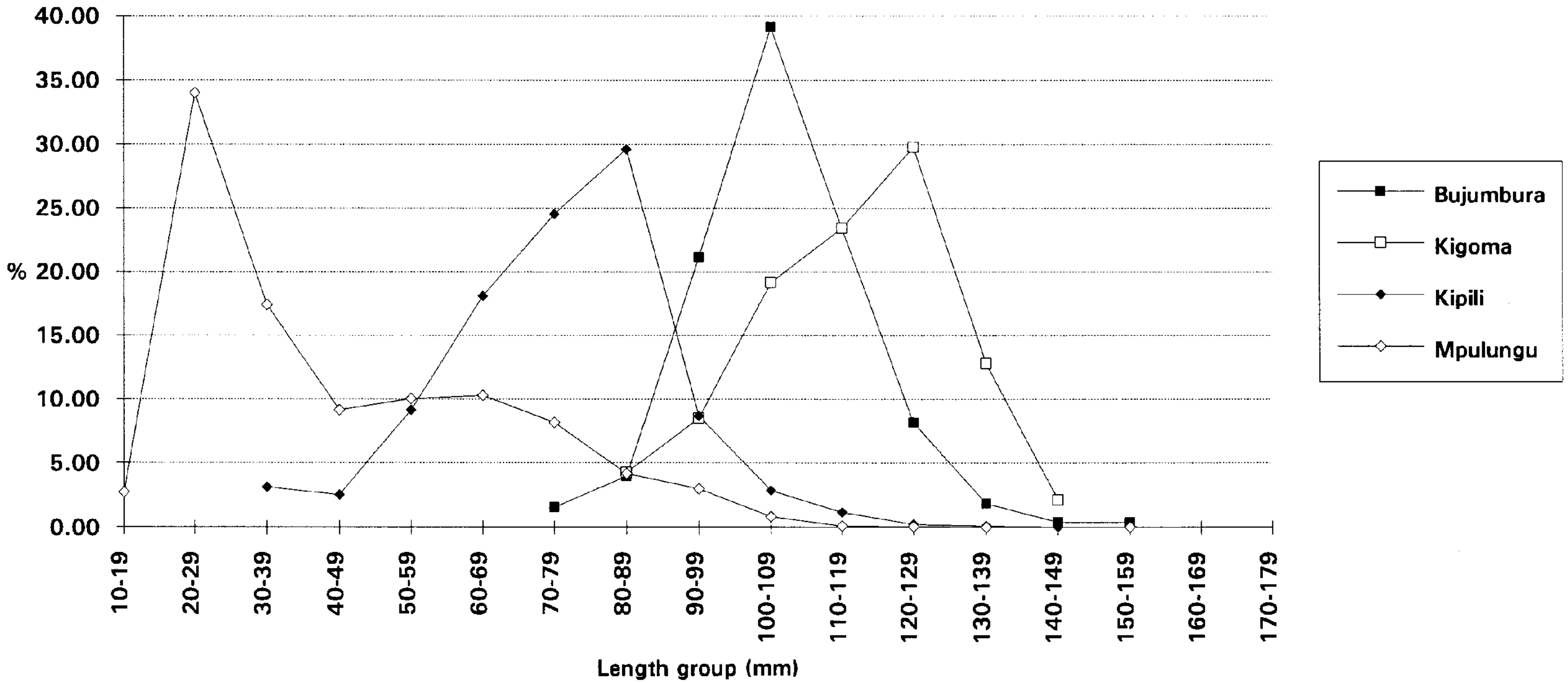


Figure 4. Total annual beach seine catch composition (%) of Limnothrissa miodon according to length groups (mm) in various sampling stations.

Figure 4. Total annual beach seine catch composition of Limnothrissa miodon in various sampling stations.



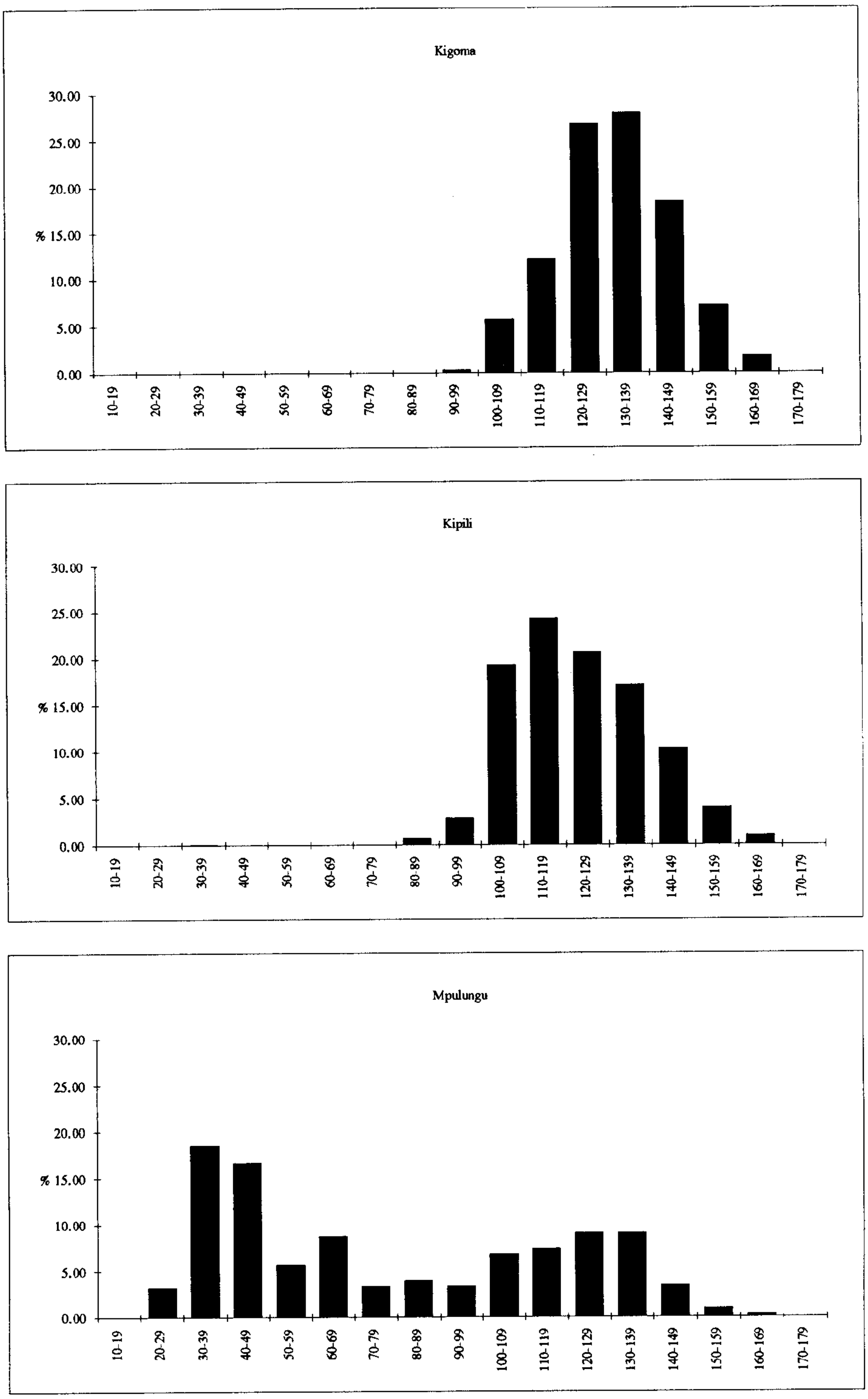
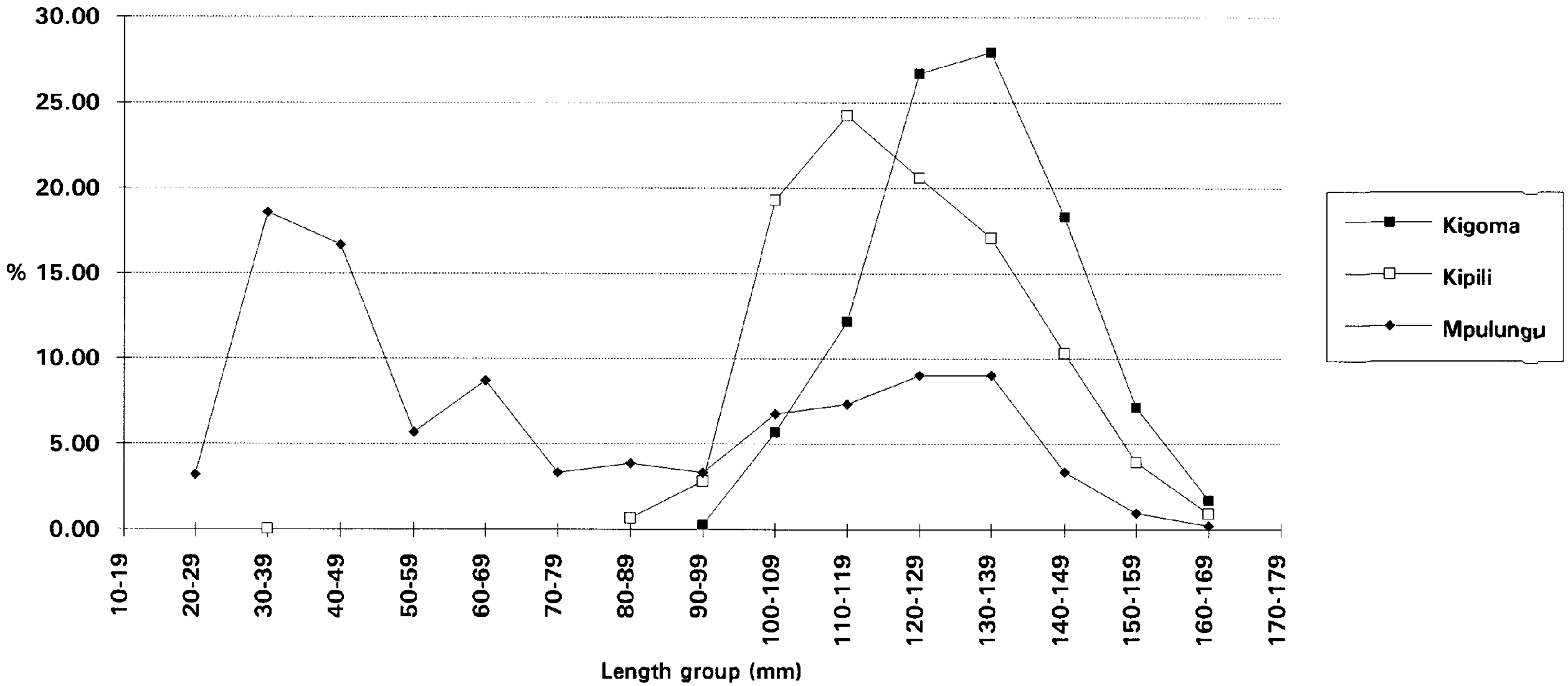


Figure 5. Total annual purse seine catch composition (%) of Limnothrissa miodon according to length groups (mm) in various sampling stations.

Figure 5. Total annual purse seine catch composition of Limnothrissa miodon in various sampling stations.



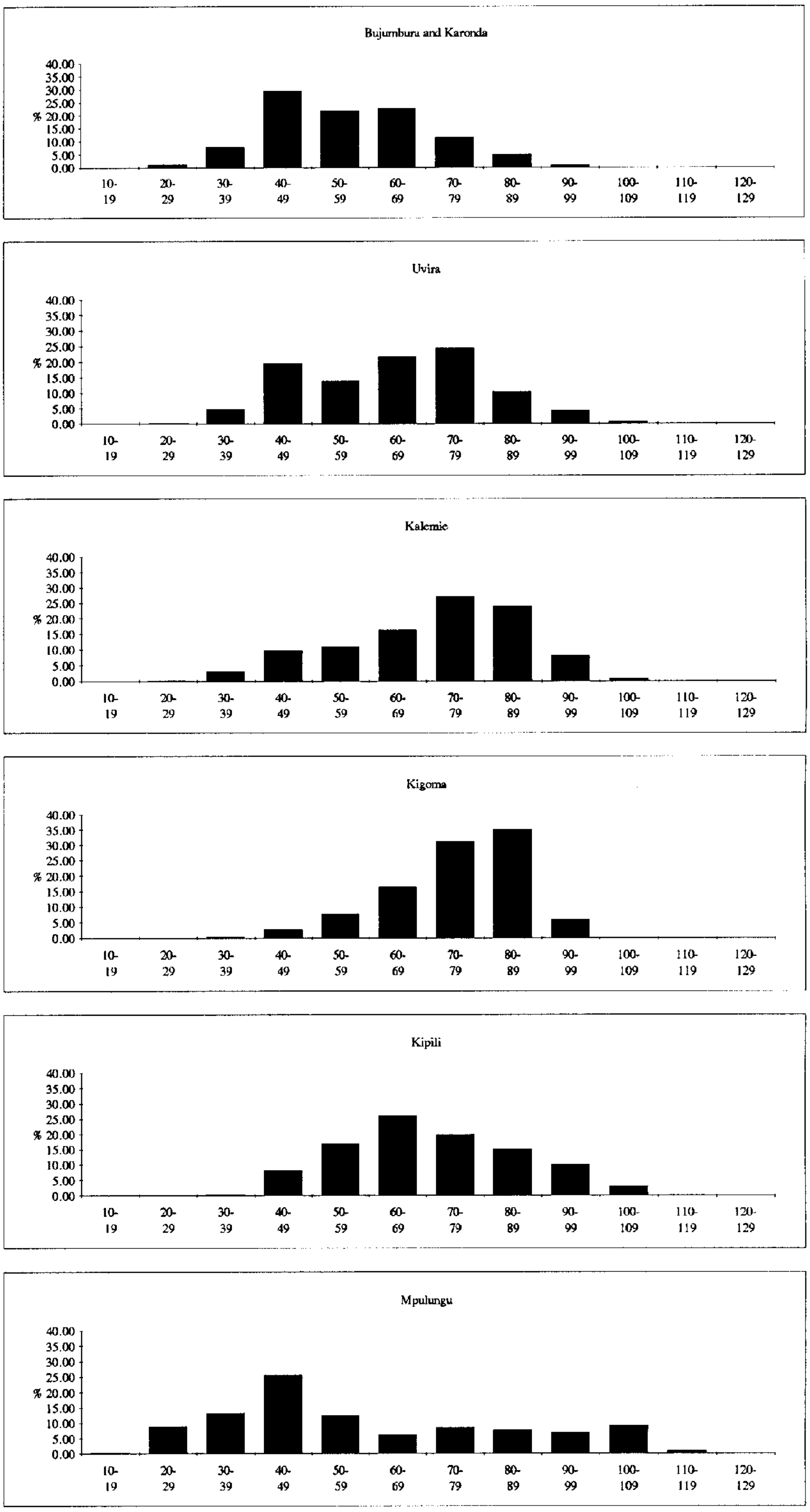
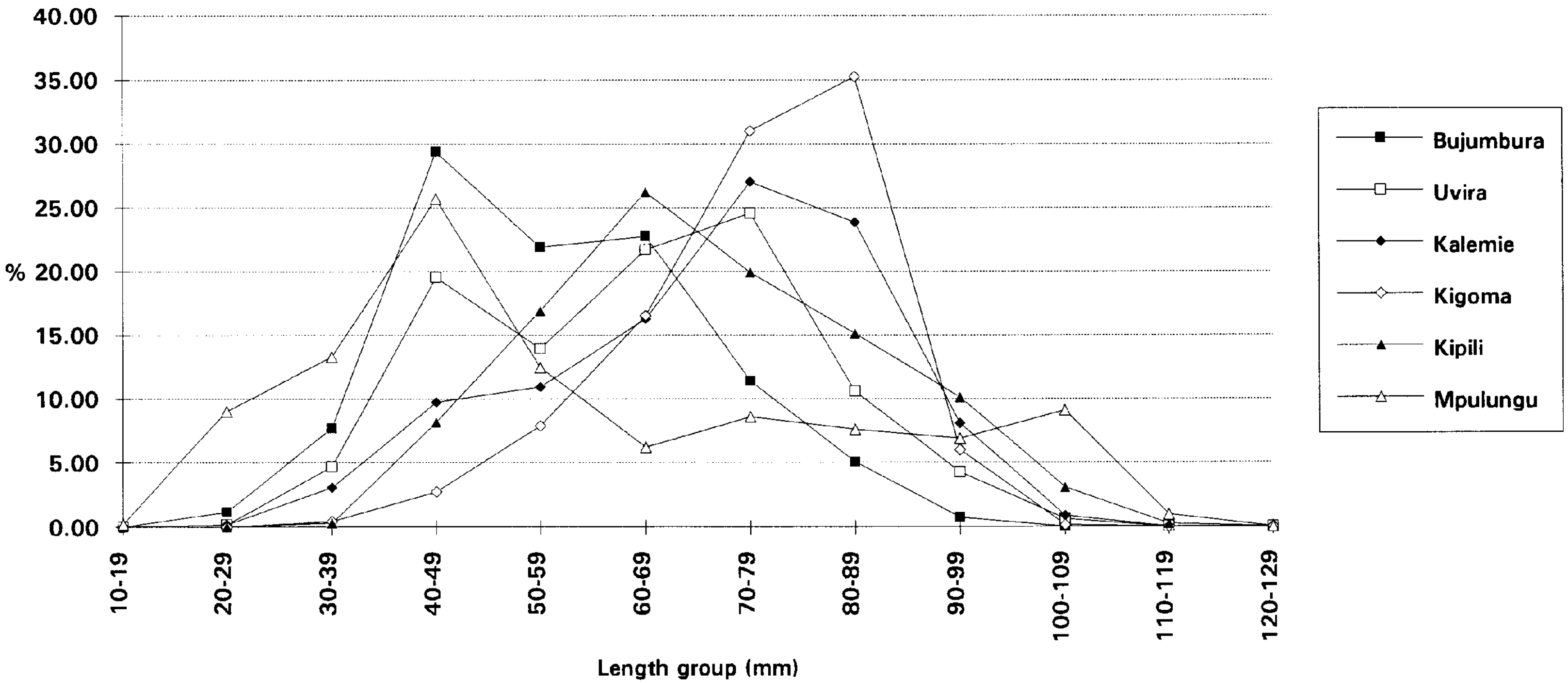


Figure 6. Total annual catch composition (%) of Stolothrissa tanganicae according to length groups (mm) in various sampling stations (all gears combined).

Figure 6. Total annual catch composition of Stolothrissa tanganicae in various sampling stations (all gears combined).



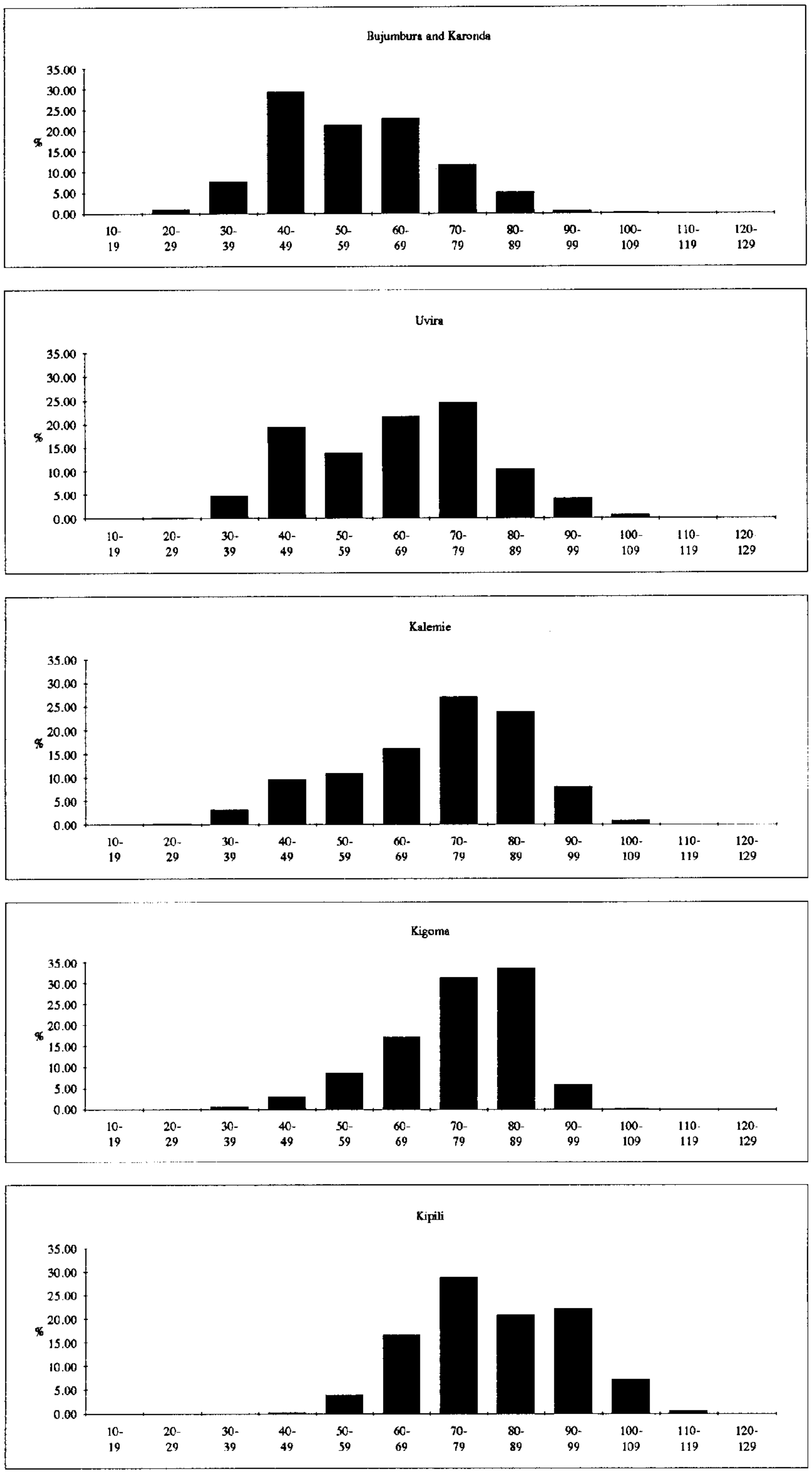
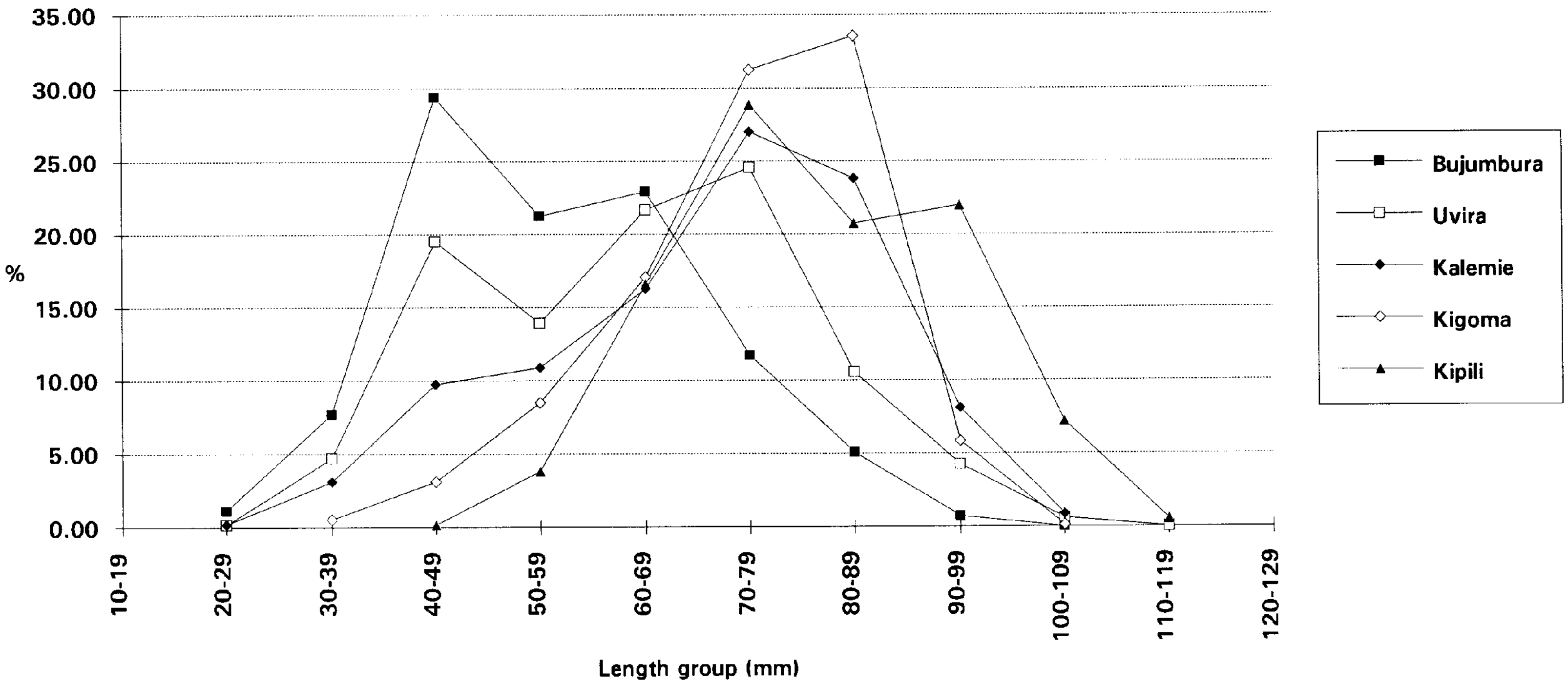
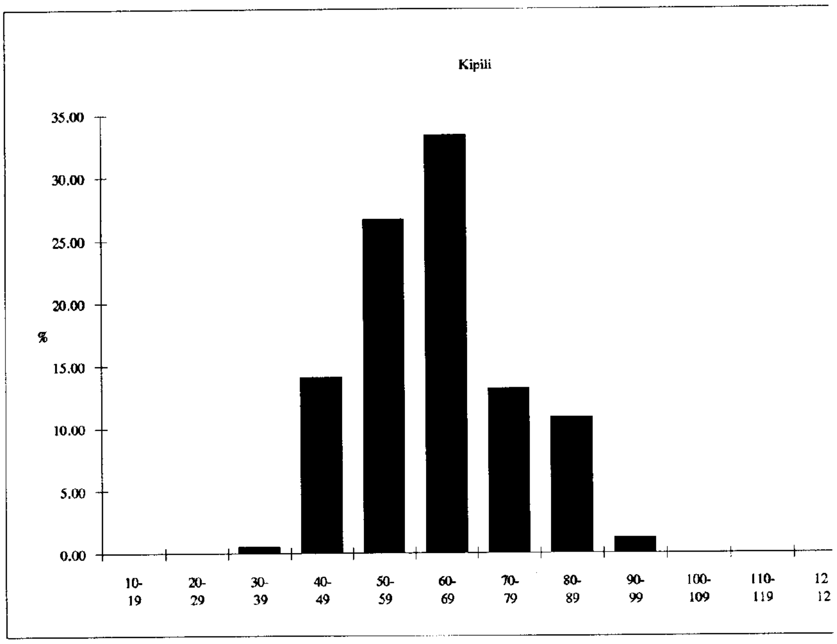


Figure 7. Total annual lift net catch composition (%) of Stolothrissa tanganicae according to length groups (mm) in various sampling stations.

Figure 7. Total annual lift net catch composition of Stolothrissa tanganicae in various sampling stations.





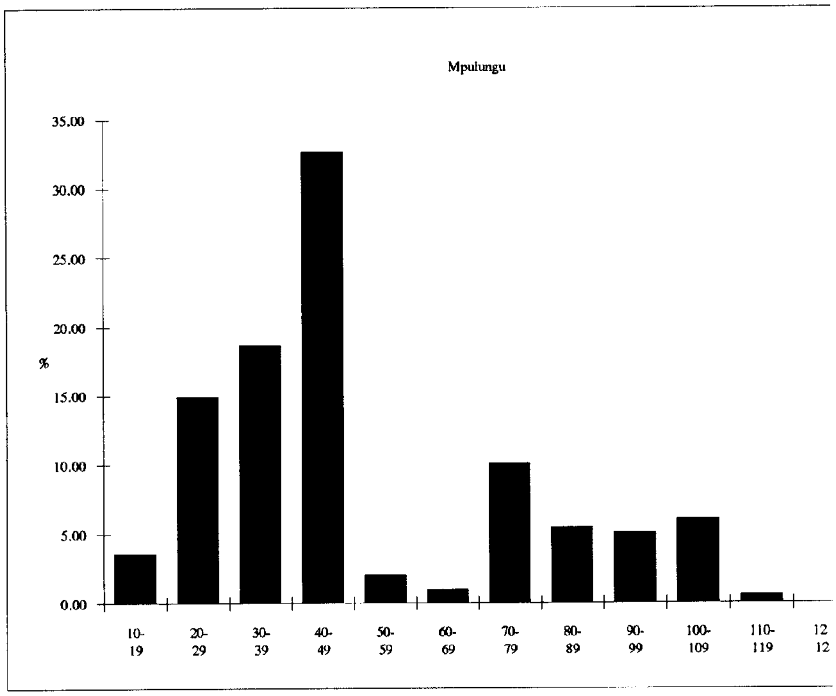
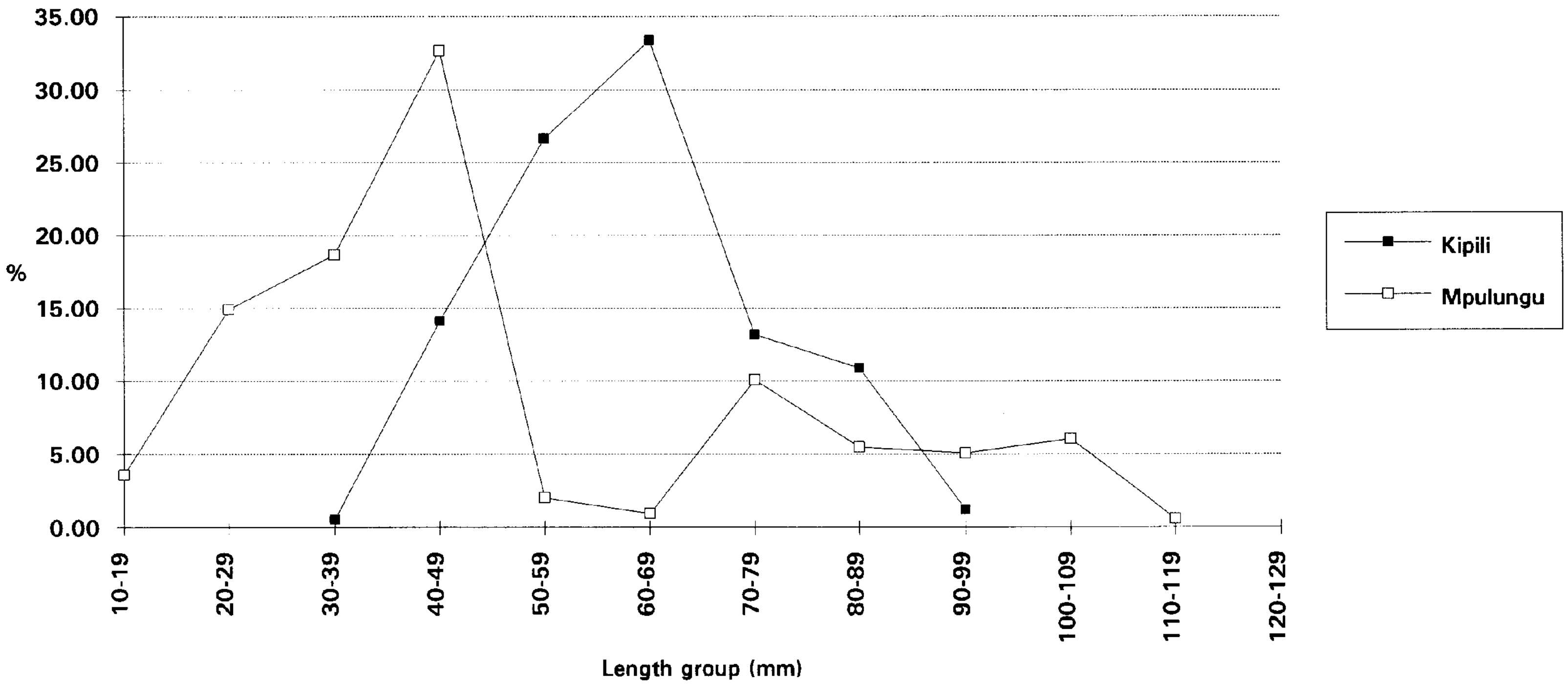


Figure 8. Total annual beach seine catch composition (%) of Stolothrissa according to length groups (mm) in Kipili and Mpulungu.

Figure 8. Total annual beach seine catch composition of Stolothrissa tanganicae in Kipili and Mpulungu sampling stations.



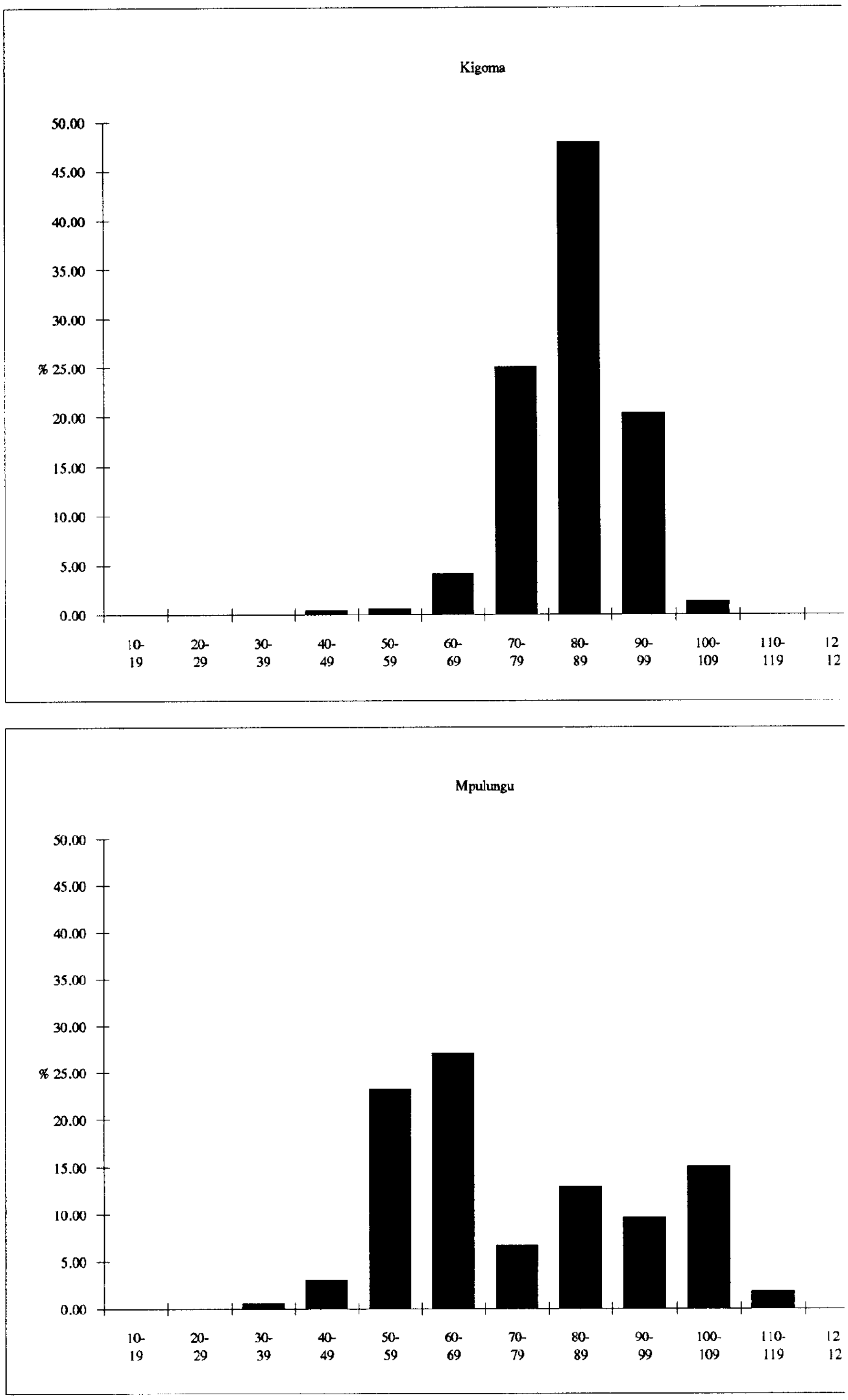
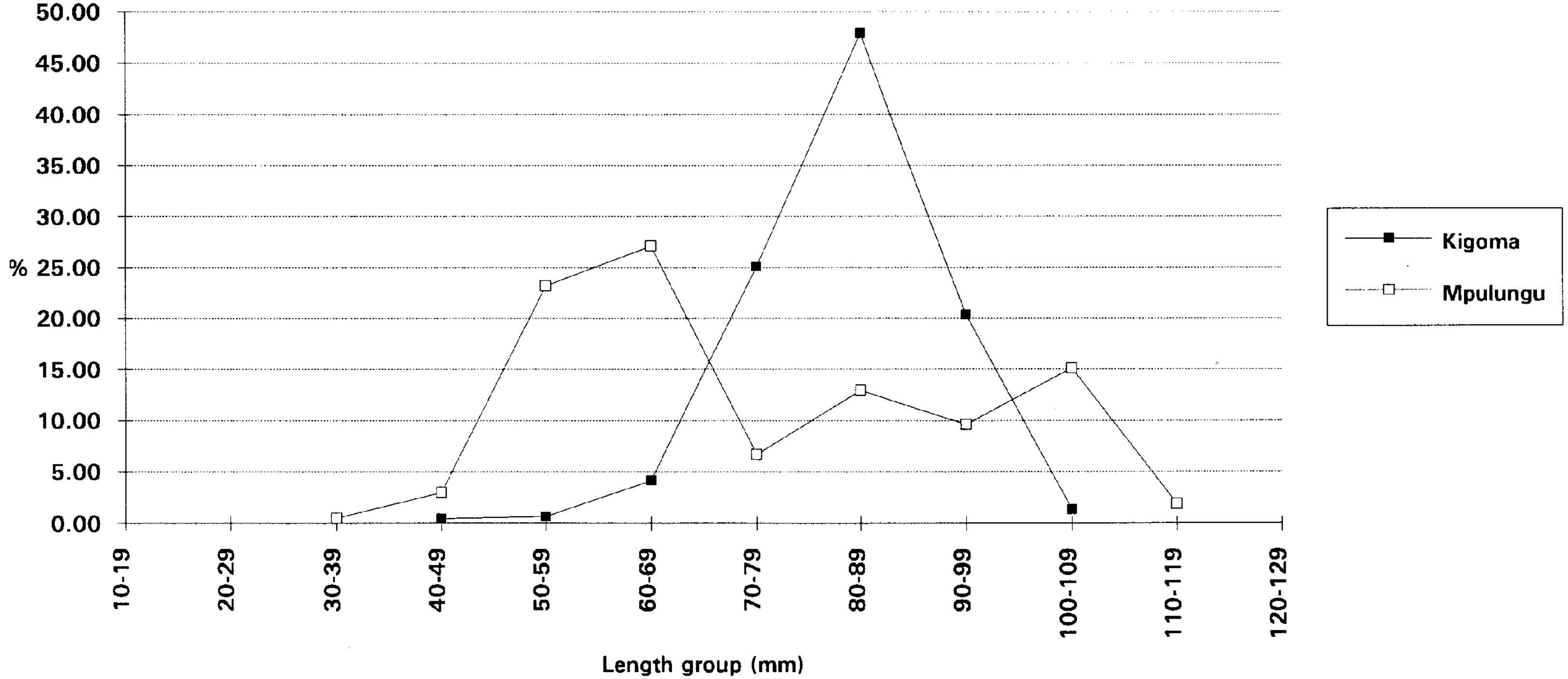


Figure 9. Total annual purse seine catch composition (%) of Stolothrissa t according to length groups (mm) in Kigoma and Mpulungu.

Figure 9. Total annual purse seine catch composition of Stolothrissa tanganicae in Kigoma and Mpulungu sampling stations.



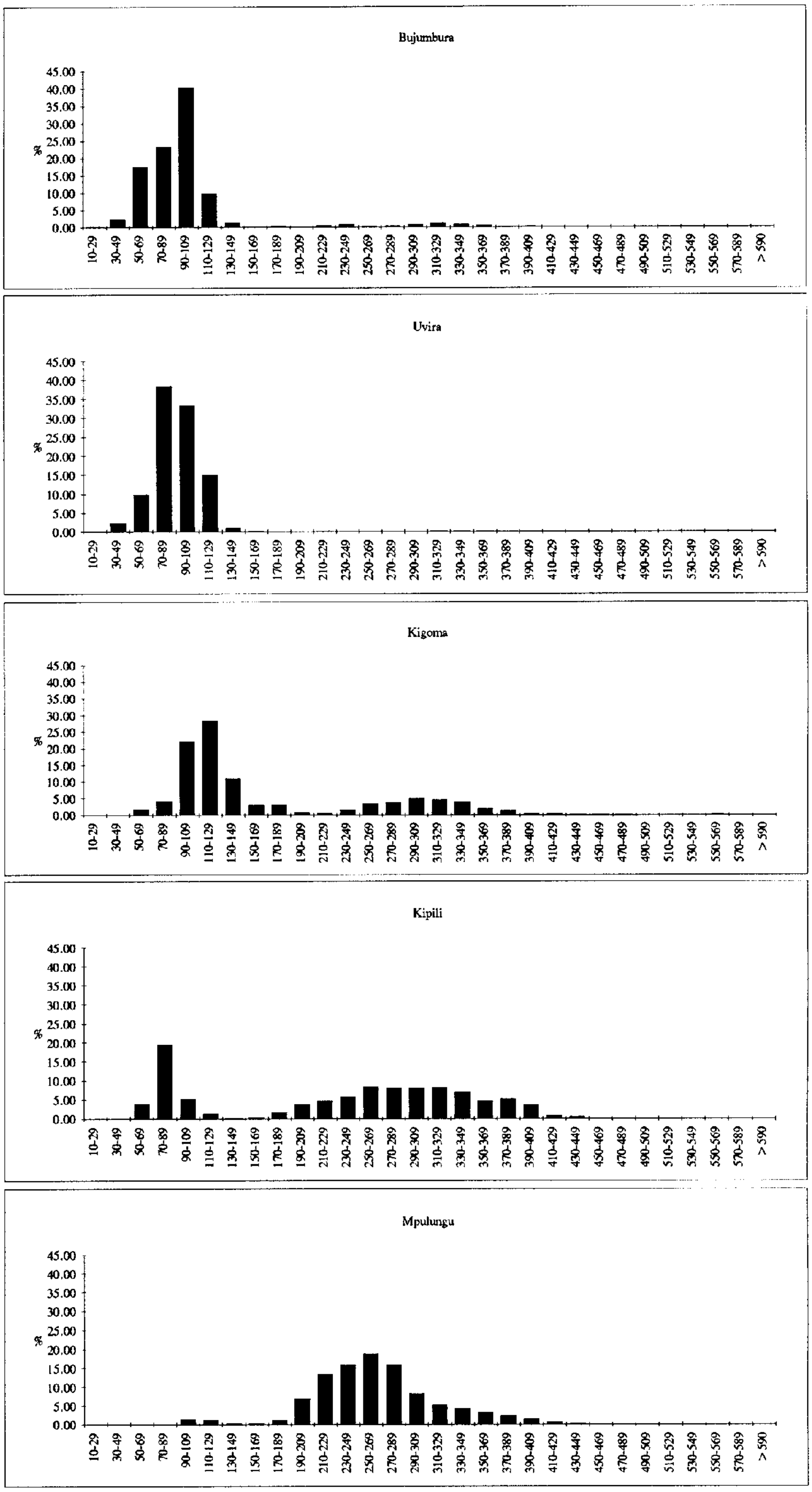
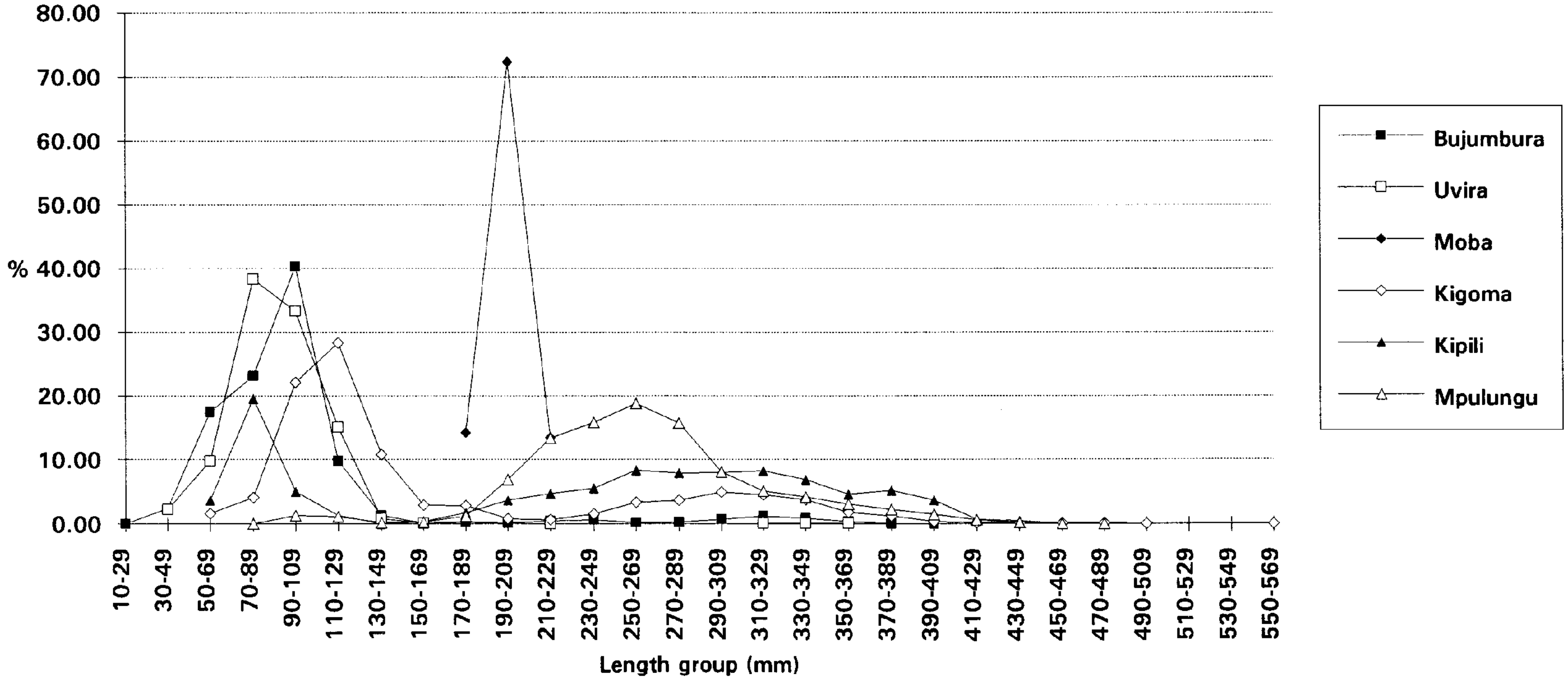


Figure 10. Total annual catch composition (%) of Lates stappersi according to length groups (mm) in various sampling stations (all gears combined: lift net catches from Moba excluded)

Figure 10. Total annual catch composition of Lates stappersi in various sampling stations (all gears combined).



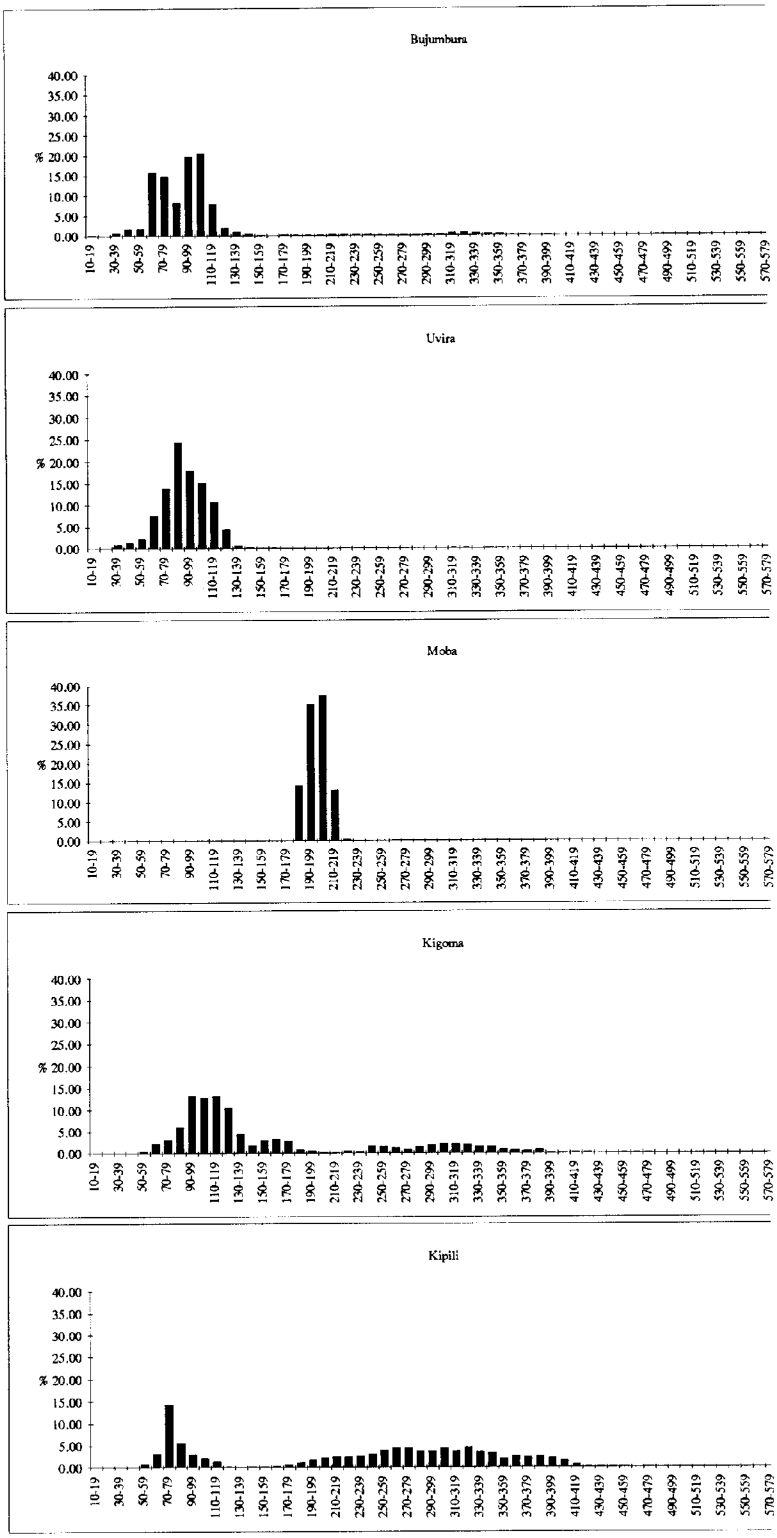
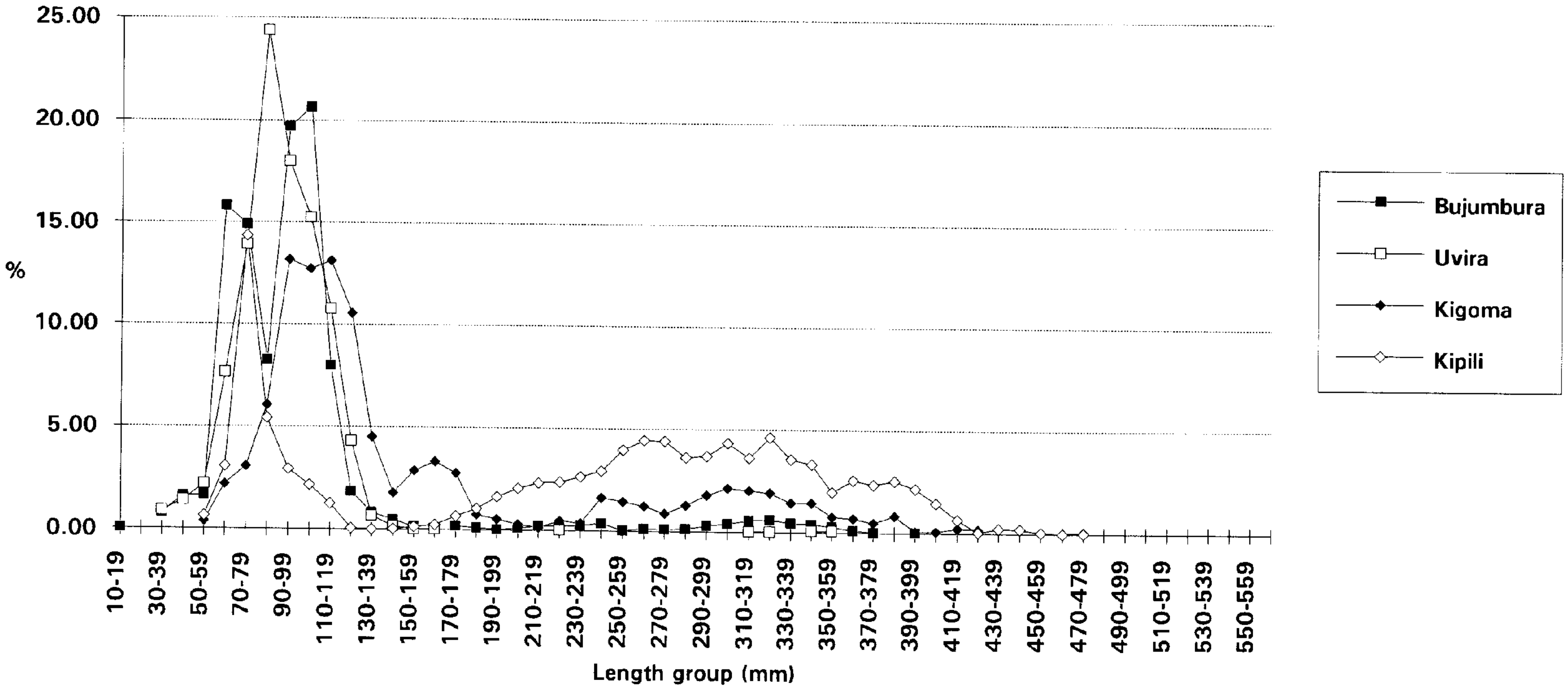
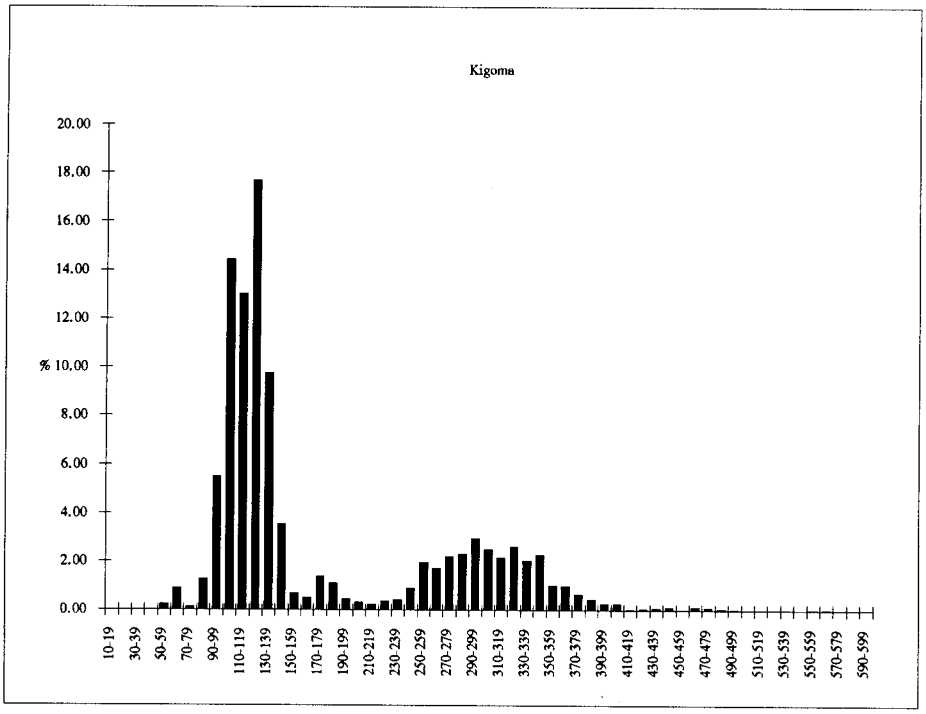


Figure 11. Total annual lift net catch composition (%) of Lates stappersi according to length groups (mm) in various sampling stations .

Figure 11. Total annual lift net catch composition of Lates stappersi in various sampling stations (Moba samples excluded).





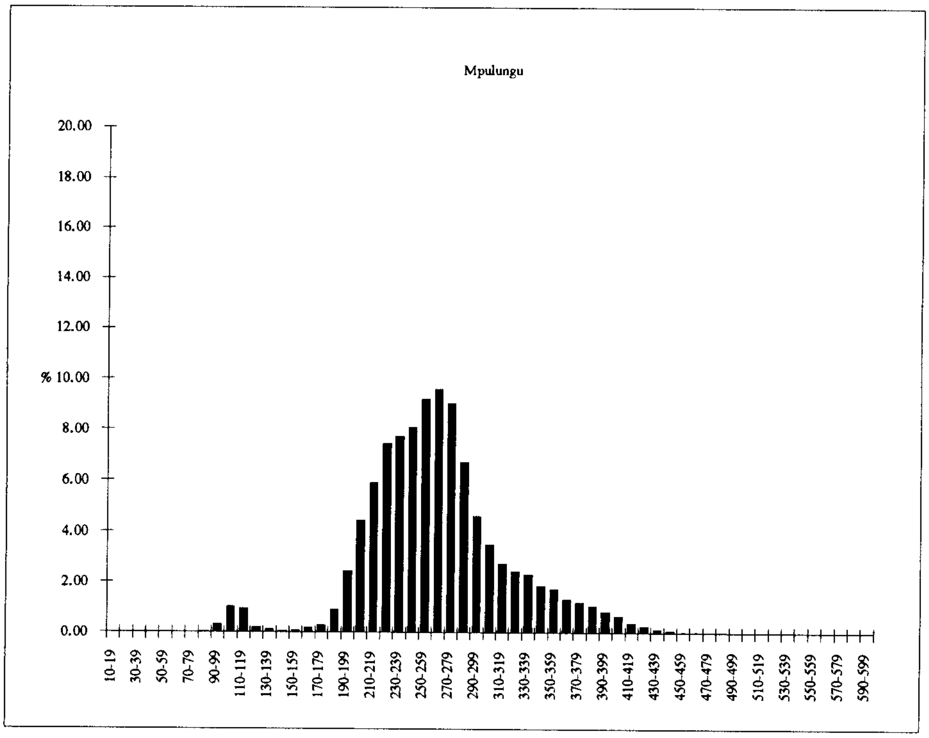


Figure 12. Total annual purse seine catch composition (%) of Lates stappersi according to length groups (mm) in Kigoma and Mpulungu.

Figure 12. Total annual purse seine catch composition of Lates stappersi in Kigoma and Mpulungu sampling stations.

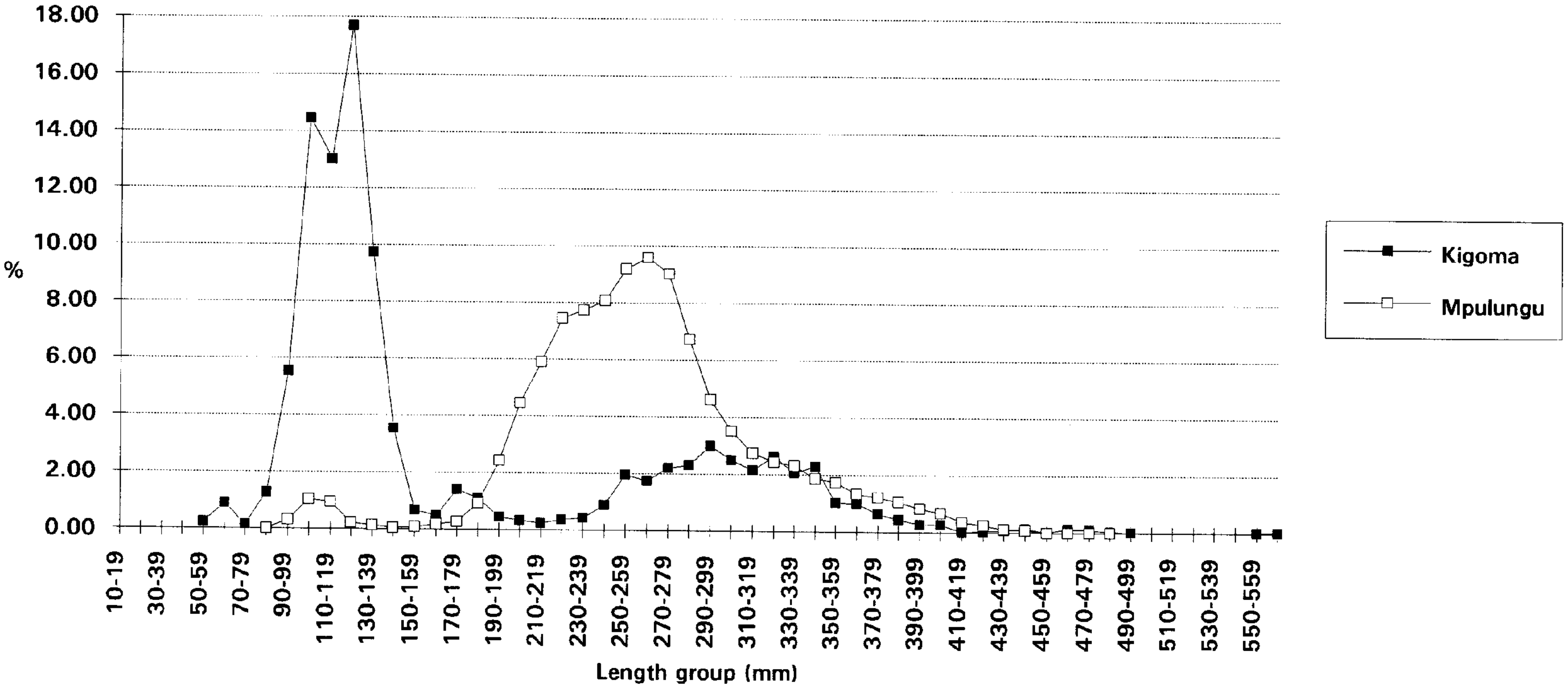


Figure 13. Limnothrissa miodon. Per cent of females mature (maturity stages 3 and 4) in various sampling stations in June 1993-July 1994.

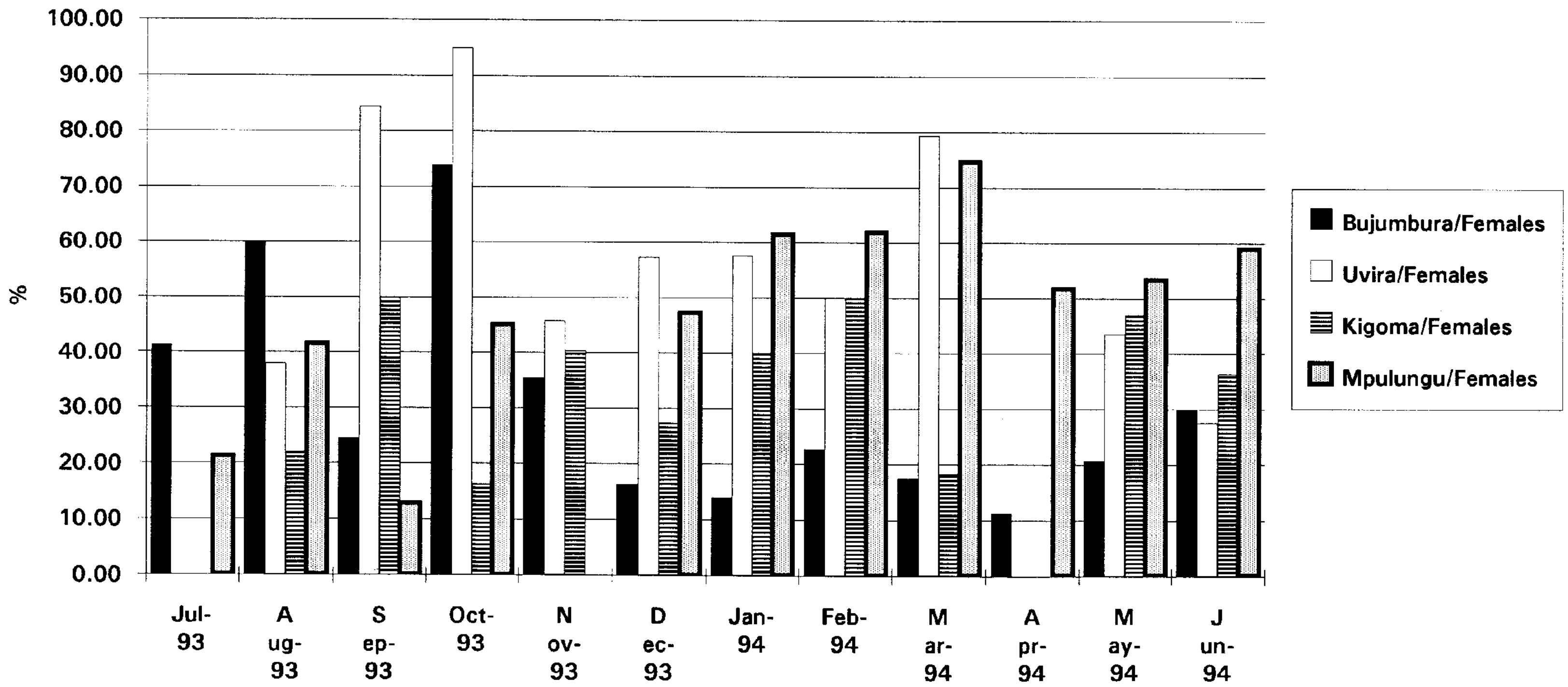


Figure 14. Limnothrissa miodon. Per cent of males mature (maturity stages 3 and 4) in various sampling stations in June 1993-July 1994.

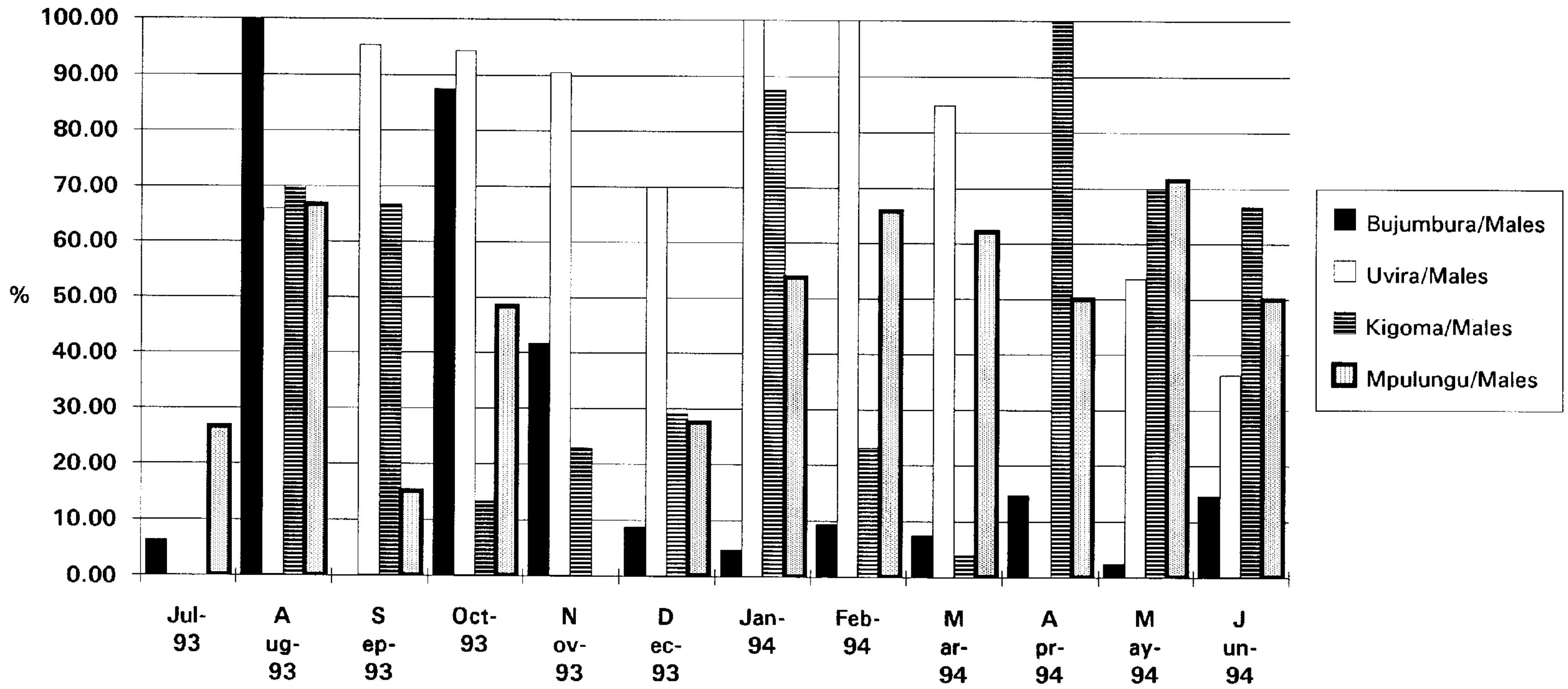


Figure 15. Stolothrissa tanganicae. Per cent of females mature (maturity stages 3 and 4) in various sampling stations in June 1993-July 1994.

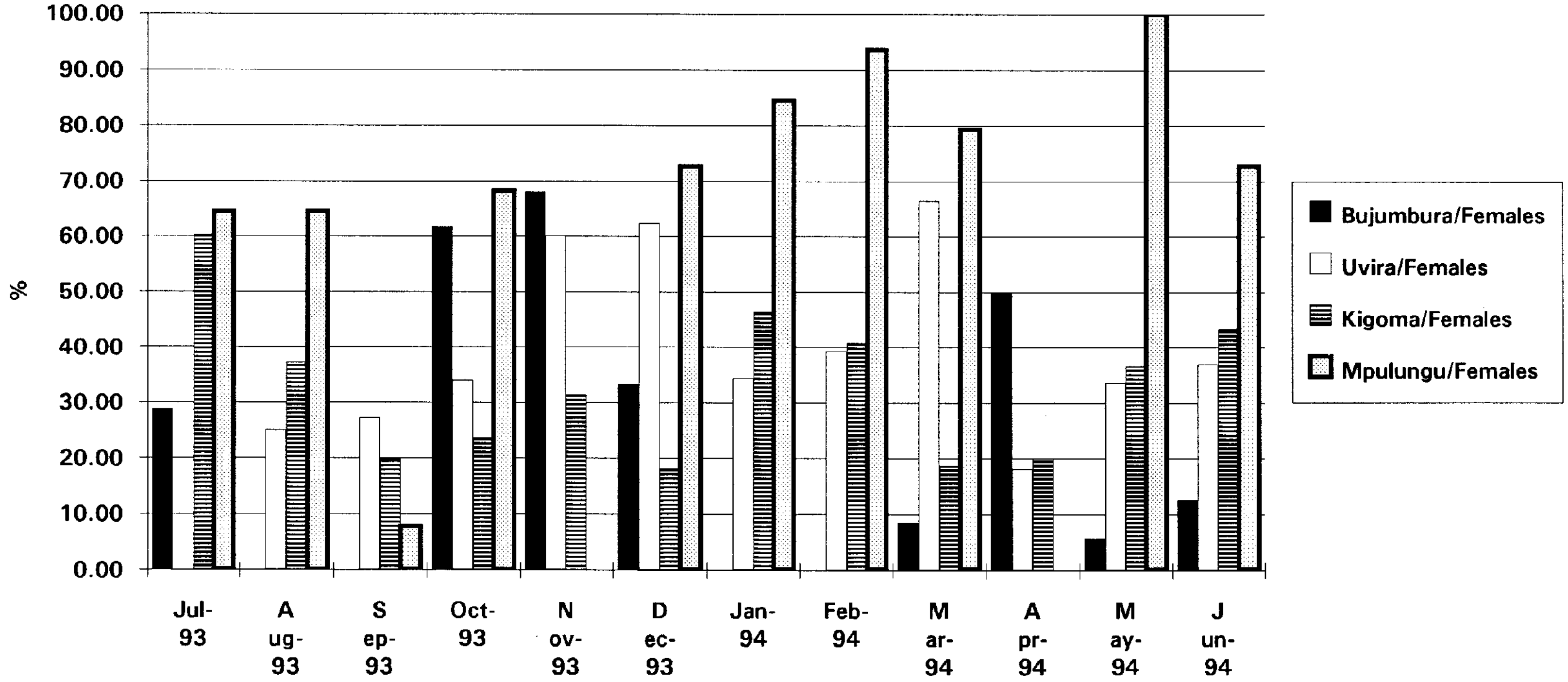


Figure 16. Stolothrissa tanganicae. Per cent of males mature (maturity stages 3 and 4) in various sampling stations in June 1993-July 1994.

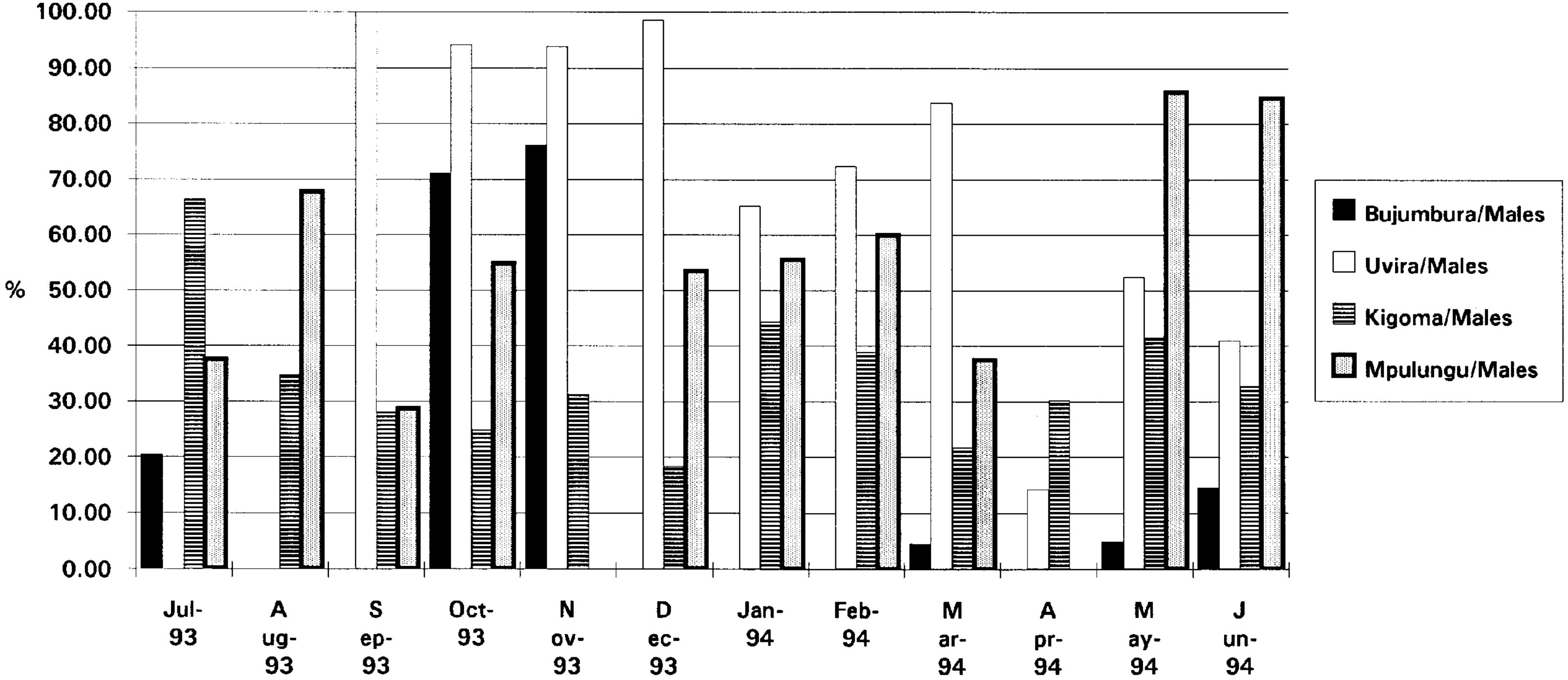


Figure 17. Lates stappersi. Per cent of females mature (maturity stages 3 and 4) in various sampling stations in June 1993-July 1994.

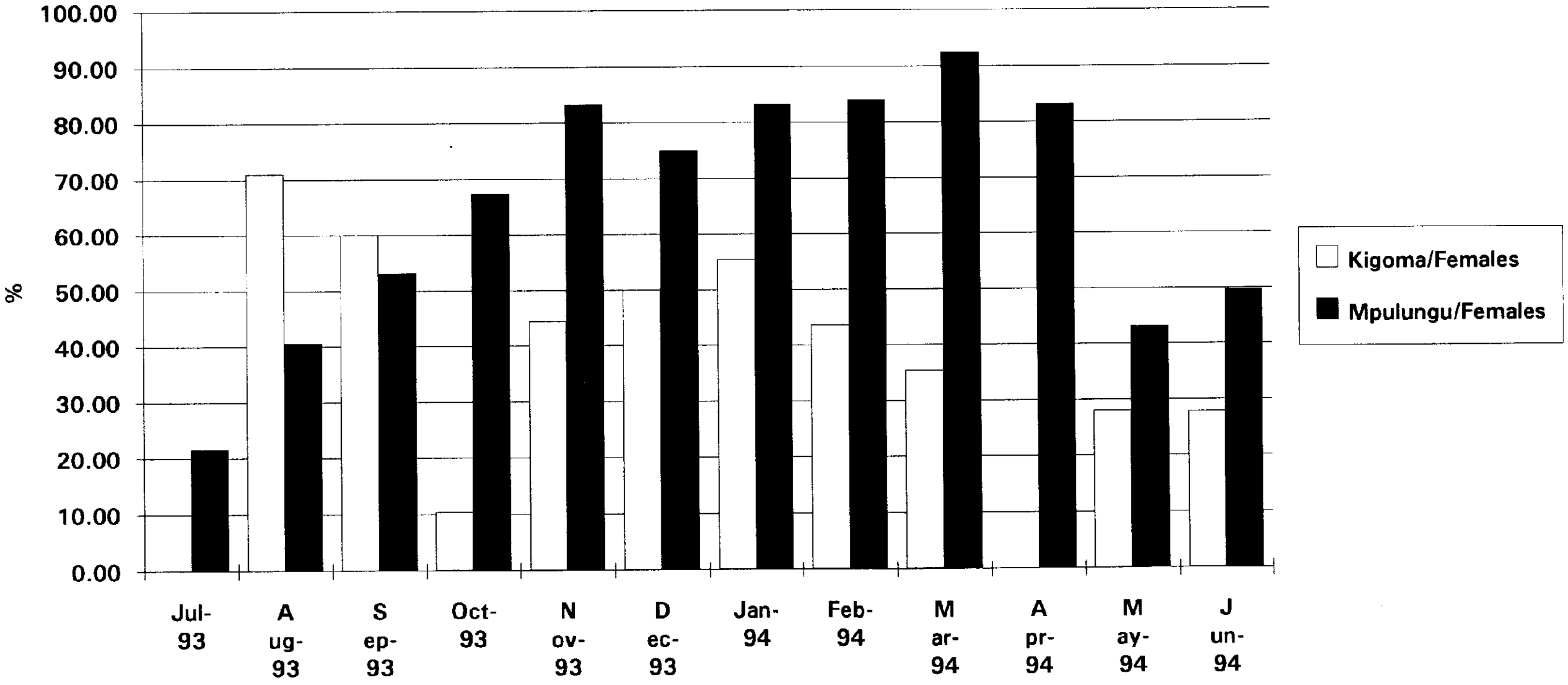


Figure 18. Lates stappersi. Per cent of males mature (maturity stages 3 and 4) in various sampling stations in June 1993-July 1994.

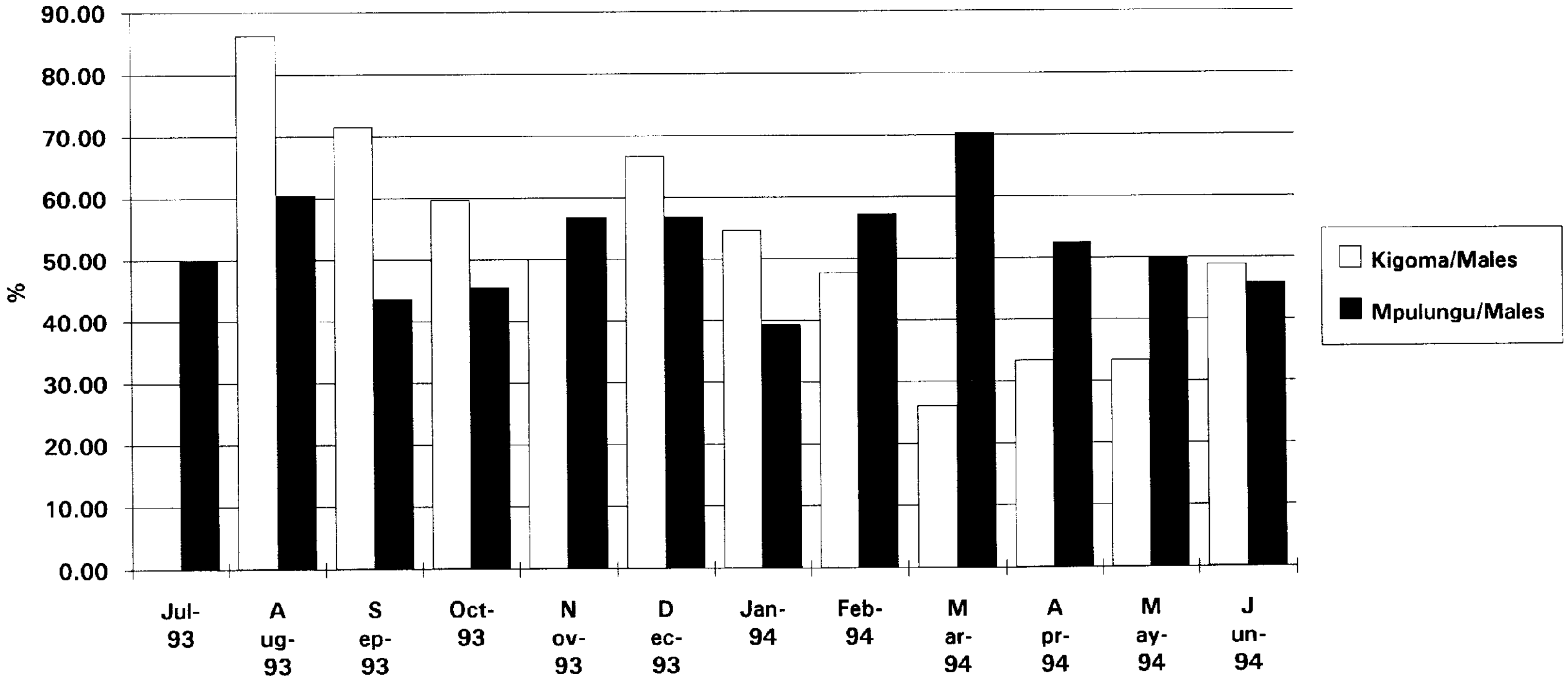


Figure 19. Length-weight relationship of Limnothrissa miodon in Lake Tanganyika.

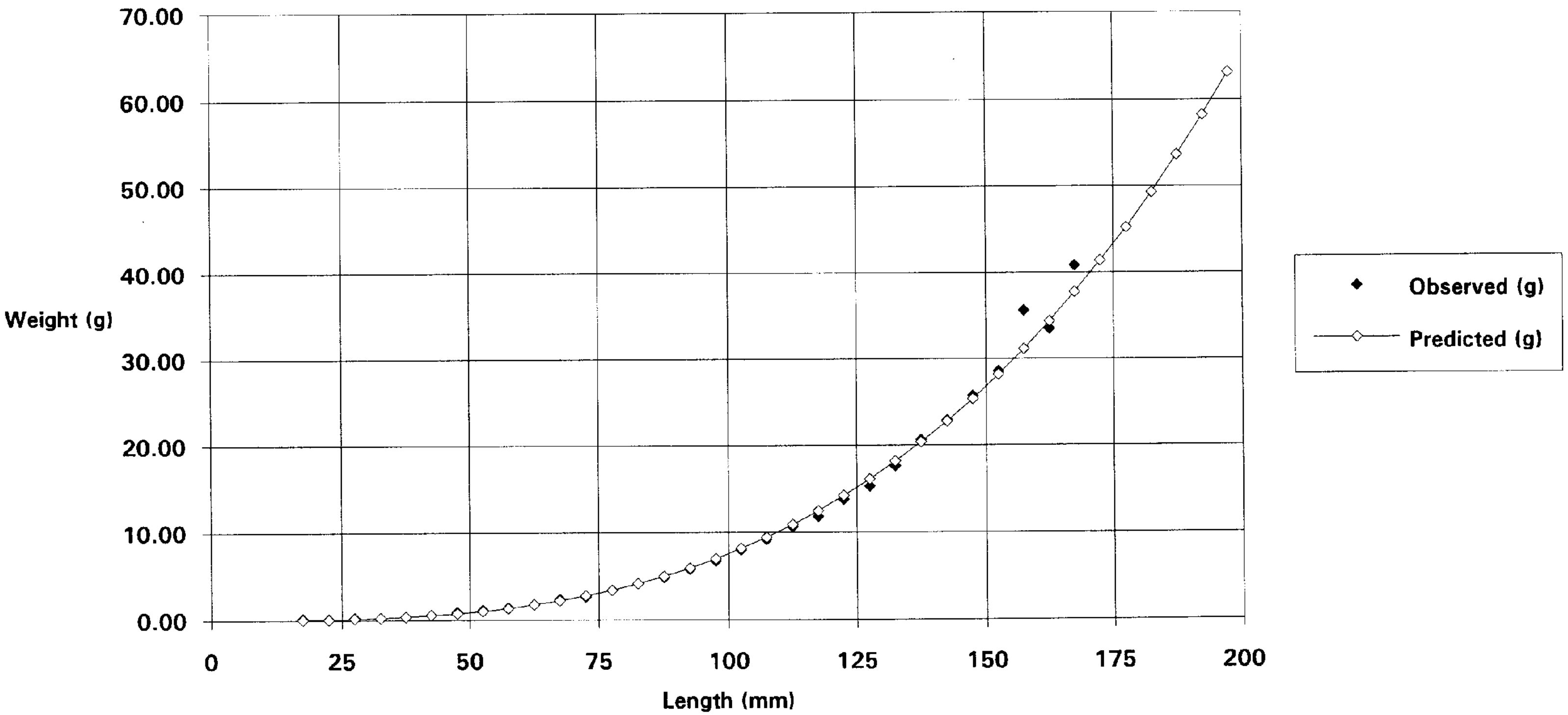


Figure 20. Length-weight relationship of Stolothrissa tanganicae in Lake Tanganyika.

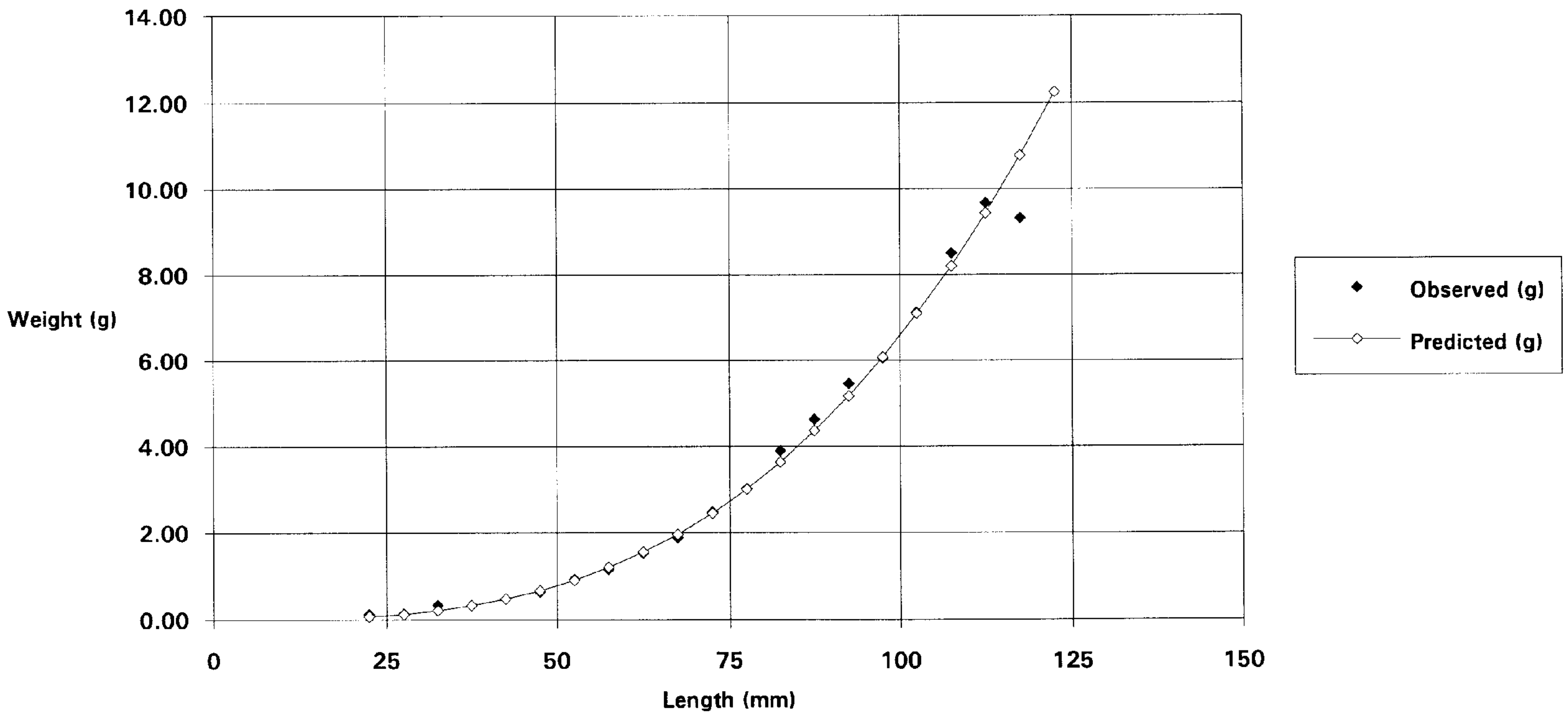
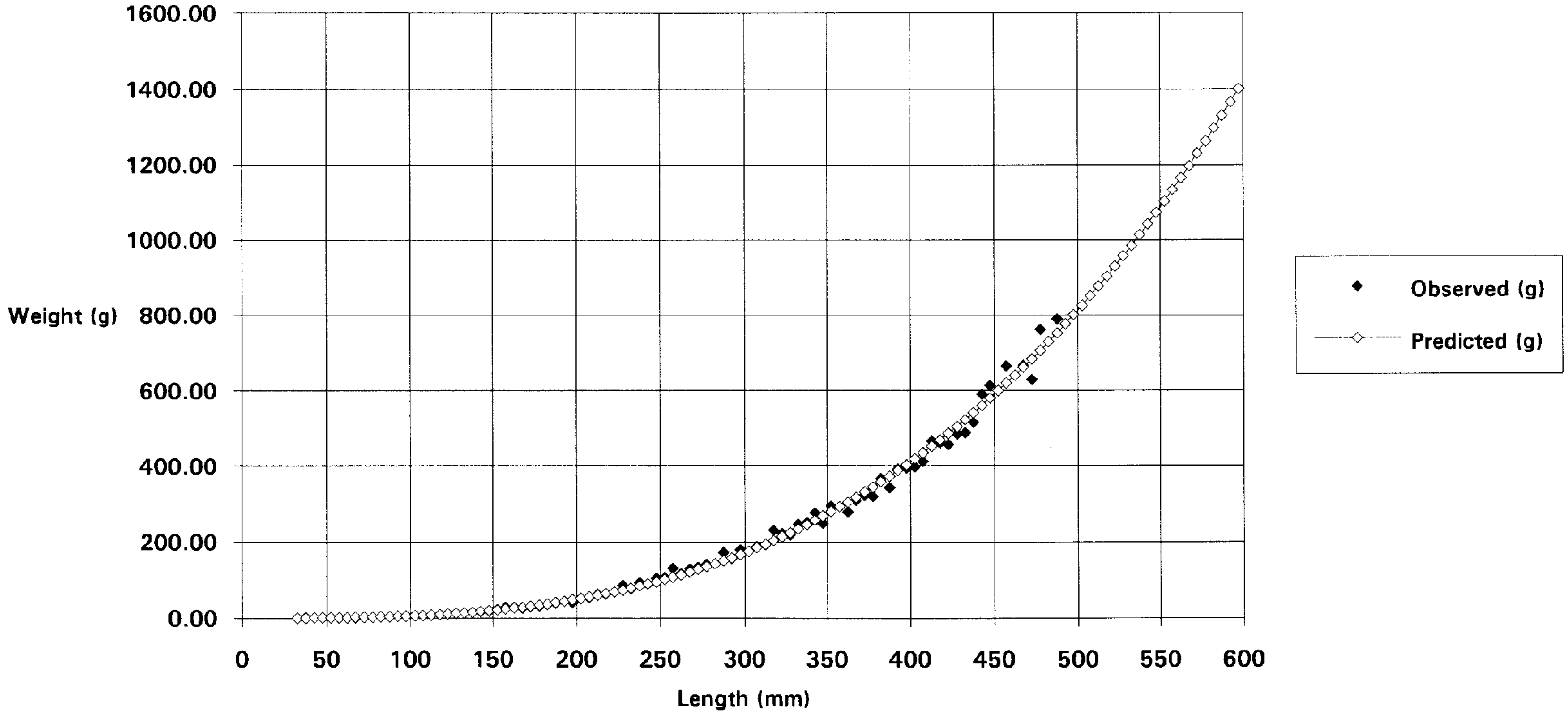


Figure 21. Length-weight relationship of Lates stappersi in Lake Tanganyika.



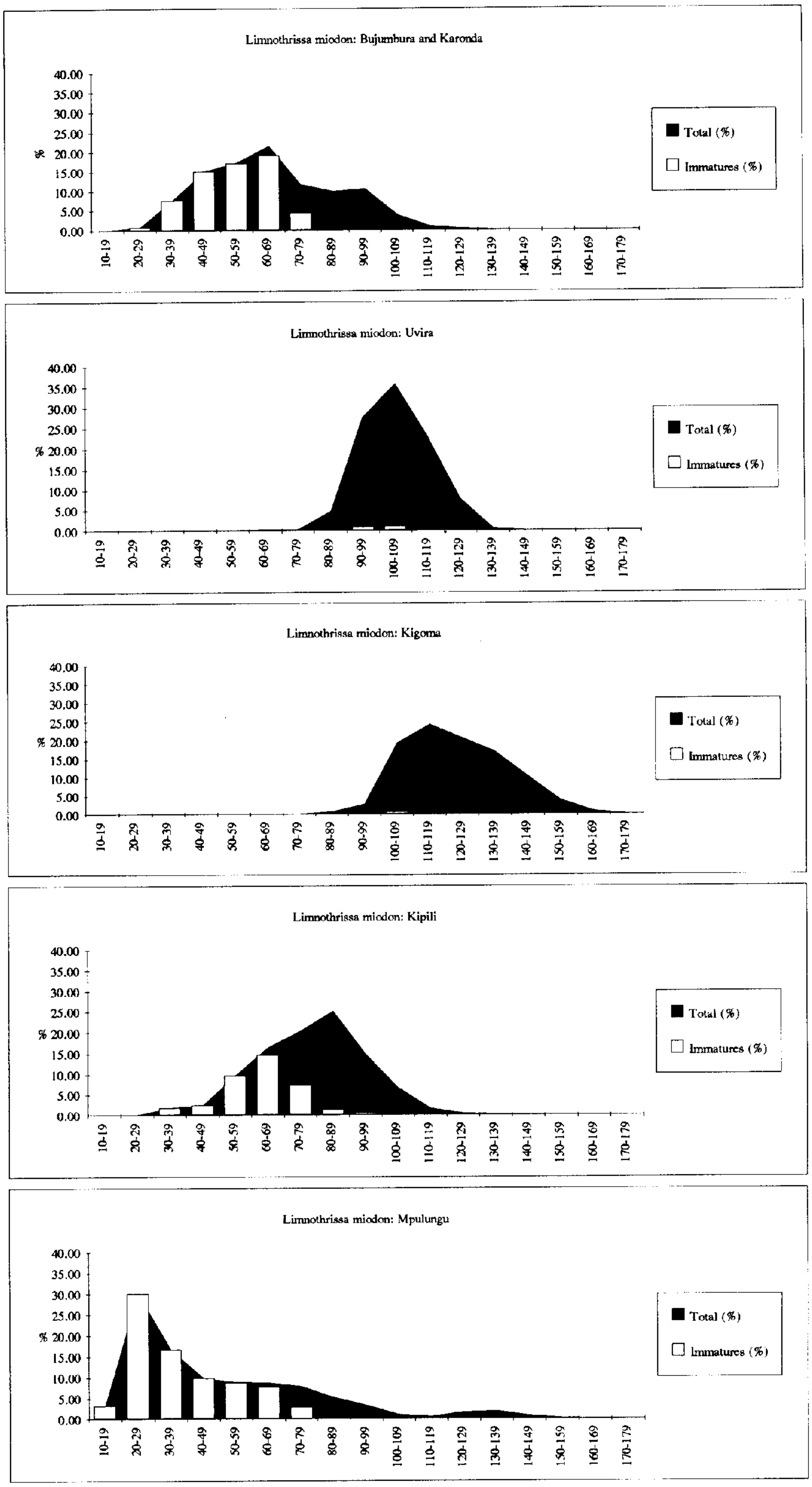


Figure 22. Limnothrissa miodon. Total catch composition and amount of immatures (%) in the catches.

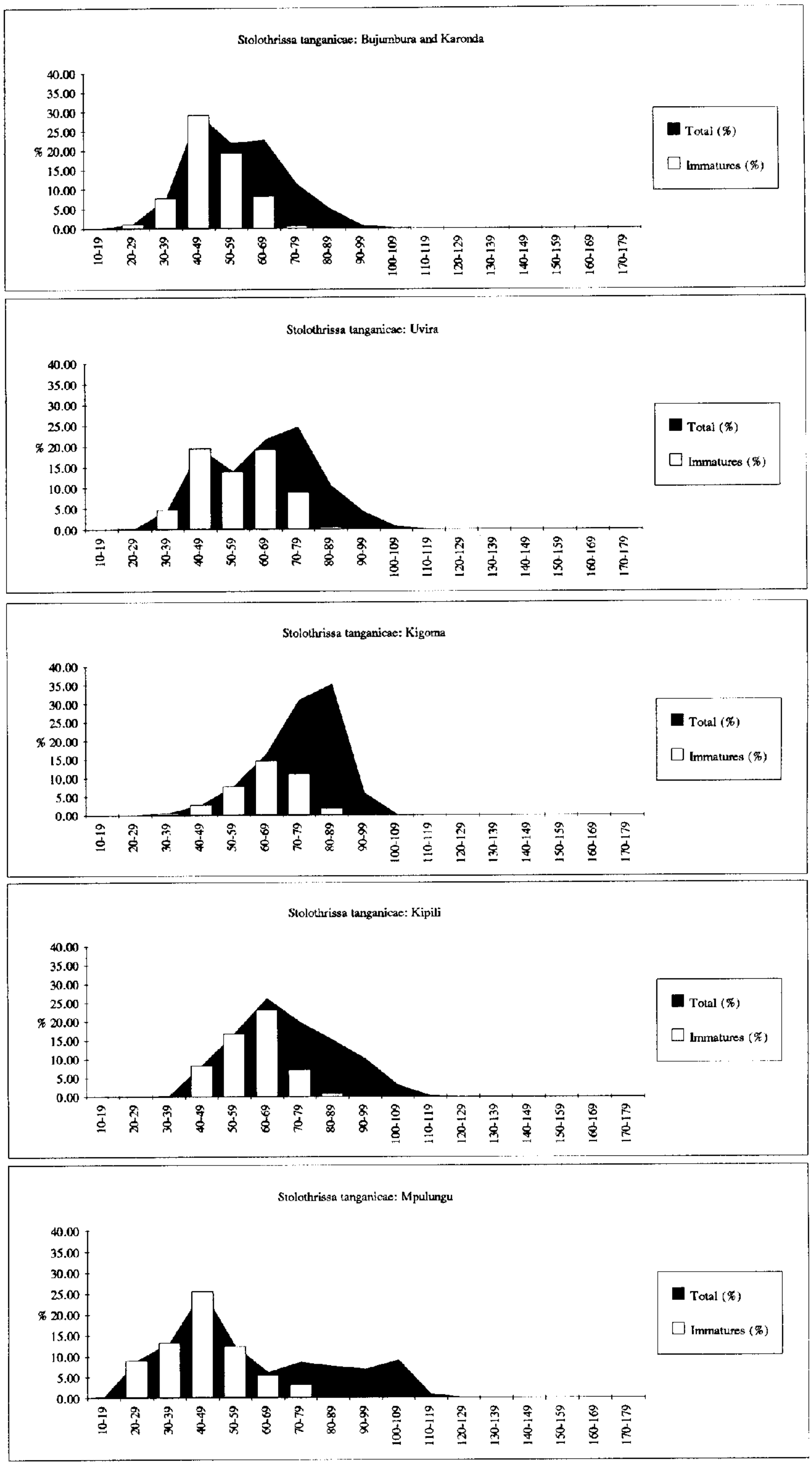


Figure 23. Stolothrissa tanganicae. Total catch composition and amount of immatures (%) in the catches.

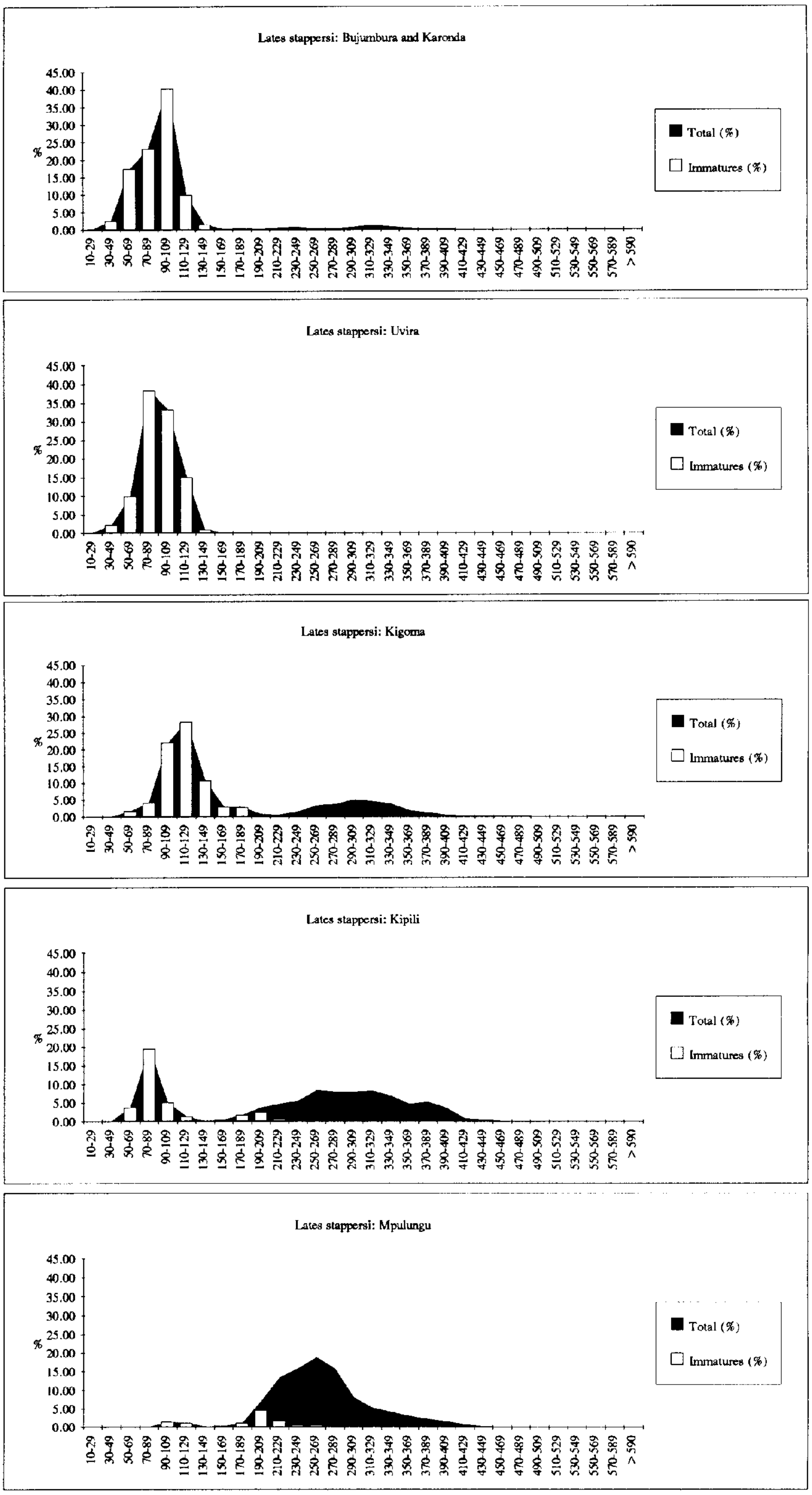


Figure 24. Lates stappersi. Total catch composition and amount of immatures (%) in the catches.