A SUMMARY OF THE 2001 / 2002 FISHING SEASON IN THE BRITISH INDIAN OCEAN TERRITORY (CHAGOS ARCHIPELAGO) FISHERIES CONSERVATION AND MANAGEMENT ZONE

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1 - INTRODUCTION

This paper provides a summary of the tuna fisheries in the British Indian Ocean Territory (Chagos Archipelago) Fisheries Conservation and Management Zone (FCMZ) during the 2001 / 2002[1] fishing season and provides a comparison against the previous year.

2 - LONGLINE FISHERY IN 2001 / 2002

Fishing operations by longline vessels have been licensed by the BIOT Authorities since the declaration of the FCMZ in 1991. Vessels from Taiwan, China dominated the longline fishery until the 1997 / 1998 season when Japanese vessels were licensed for the first time. Japanese vessels have taken up roughly 20% of all the longline licenses issued in the four seasons since they entered the fishery.

The 2001 / 2002 longline season ended with a total estimated catch of 1034 MT based upon logbooks and radio reports where logbooks have not yet been returned. Table 1 below, provides a summary for the period 2000 / 2001 and 2001 / 2002, showing the number of vessels licensed, total licences issued and total catch and effort.

Table 1: BIOT FCMZ longline summary 2000 / 2001 and 2001 / 2002

Year	**2000/2001**	**2001/2002**
Number of Vessels	64	36
Number of Days Fished	2052	901
Total Catch (MT)	1828	1034
CPUE (MT / day)	0.891	1.148
CPUE (MT / 1000 hooks)	0.297	0.382

The catch per unit effort in terms of MT day^{-1} for 2001 / 2002 was higher than the previous year, at an average of 1.148 MT day^{-1} (0.382 MT / 1000 hooks).

A summary of catch rates for Japanese and Taiwanese vessels is shown in Table 2.

Table 2: BIOT FCMZ Longline CPUE (MT day^{-1}) in 2000 / 2001 and 2001 / 2002.

Year	**2000/2001**	**2001/2002**
Japanese	1.412	1.200
Taiwanese	0.758	0.899
Total (BIOT FCMZ)	0.890	1.148

The catch composition of the Taiwanese and Japanese longline fleets in 2000 / 2001 and 2001 / 2002 are shown in Figures 1 and 2 below. The species composition of the catch for Japanese vessels this season shows a marked difference compared to previous years with a much higher proportion of the higher value bigeye tuna taken, however not all logbooks have yet bee returned, so these figures must be considered as preliminary. In the past, the Taiwanese longline fleet has generally taken proportionately more yellowfin tuna than the Japanese longline fleet.

1 For the purposes of the report, the fishing season for the BIOT FCMZ (Chagos Archipelago) is defined as running from the 1st of April through to the 31st of March the following year. This season definition is used because the main historical peaks in the purse seine and longline seasons in the BIOT FCMZ (Chagos Archipelago) occur during the months of December and January.

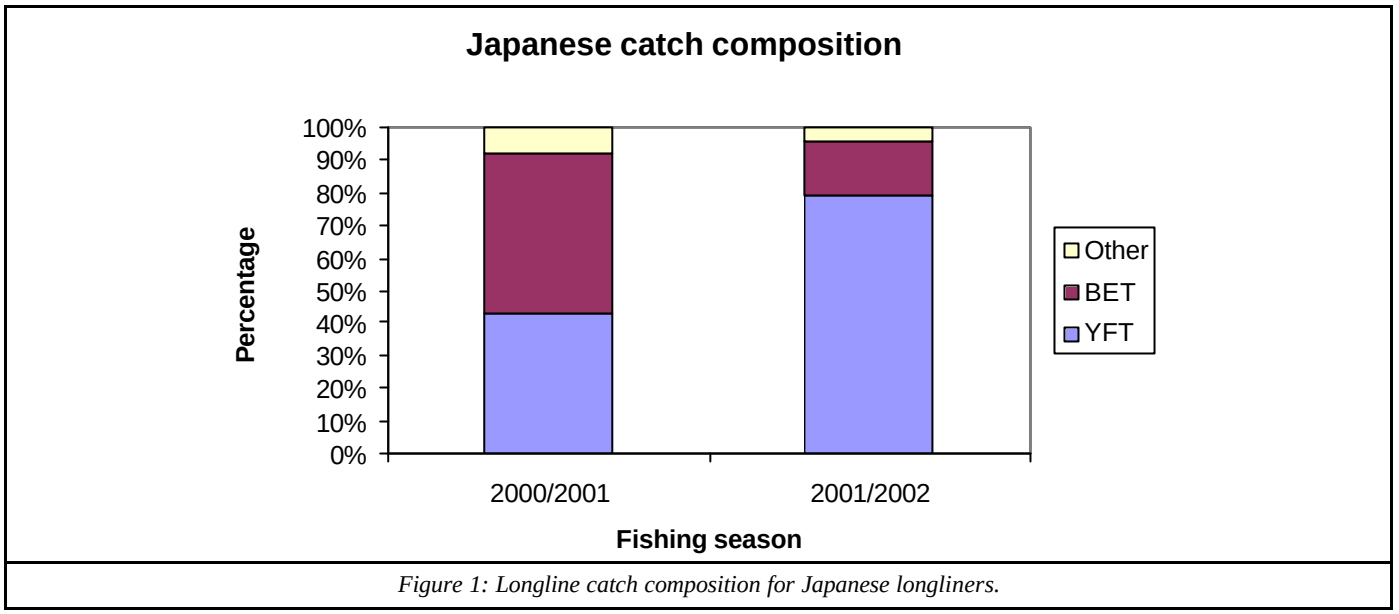

Figure 1: Longline catch composition for Japanese longliners.

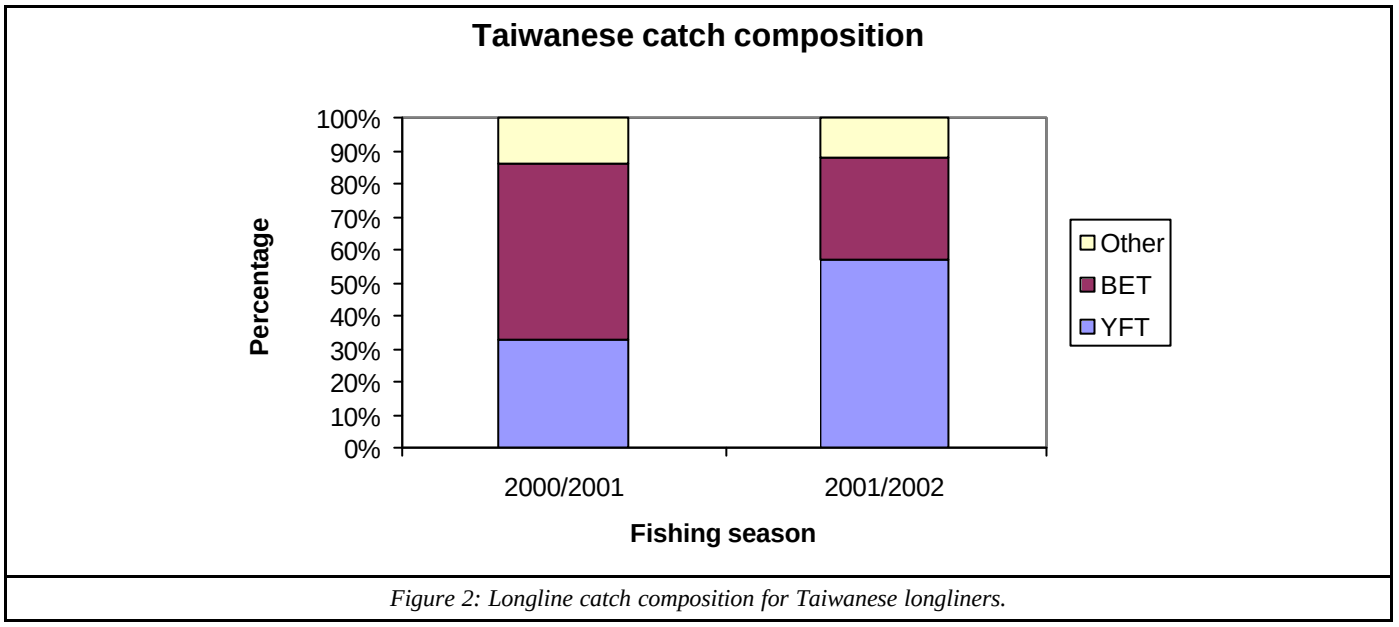

Figure 2: Longline catch composition for Taiwanese longliners.

3 - PURSE SEINE FISHERY IN 2001 / 2002

A total of 54 vessels was licensed during the 2001 / 2002 fishing season, comprising 50 purse seiners and four support vessels. All but one of the purse seiners were European owned and managed.

Total catches for the season of the main commercial species amounted to 5795 tonnes, higher than the previous two year's catches. This catch was taken in 379 days fishing, at an average catch rate of 15.29 MT day^{-1}.

A breakdown by nation shows that Spanish-managed vessels spent 241 days in the BIOT FCMZ taking 4589 MT, giving them a daily catch rate of 19.04 MT day$^{-1.}$ The French-managed vessels spent 138 days in the BIOT FCMZ, taking 1206 MT, a catch rate of 8.74 MT day^{-1}.

A summary of the 2001/2002 season against the previous season is shown in Table 3.

Table 3: Summary of the last two purse seine seasons.

Year	2000/2001	2001/2002
Number of Vessels	48	50
Number of Licences	48	50
Number of days fished	109	379
Total Catch (MT)	1064	5795

Catch activity in the fishery was very similar to previous years, with a main peak in activity at the end of December through to mid-January and a smaller peak at the end of January. From the reports of the observers deployed this season it was suggested that the season may have been curtailed this year due to bad weather in the second half of January. This had the effect of disrupting any large concentrations of yellowfin tuna, making them more difficult to catch.

The species composition this year was dominated by large free-schooling yellowfin tuna, which made up nearly 60% of the catch, with 36% skipjack tuna and small amounts of juvenile bigeye and albacore. Species compositions for Spanish and French purse seiners for the current and previous seasons are shown in Figures 3 and 4.

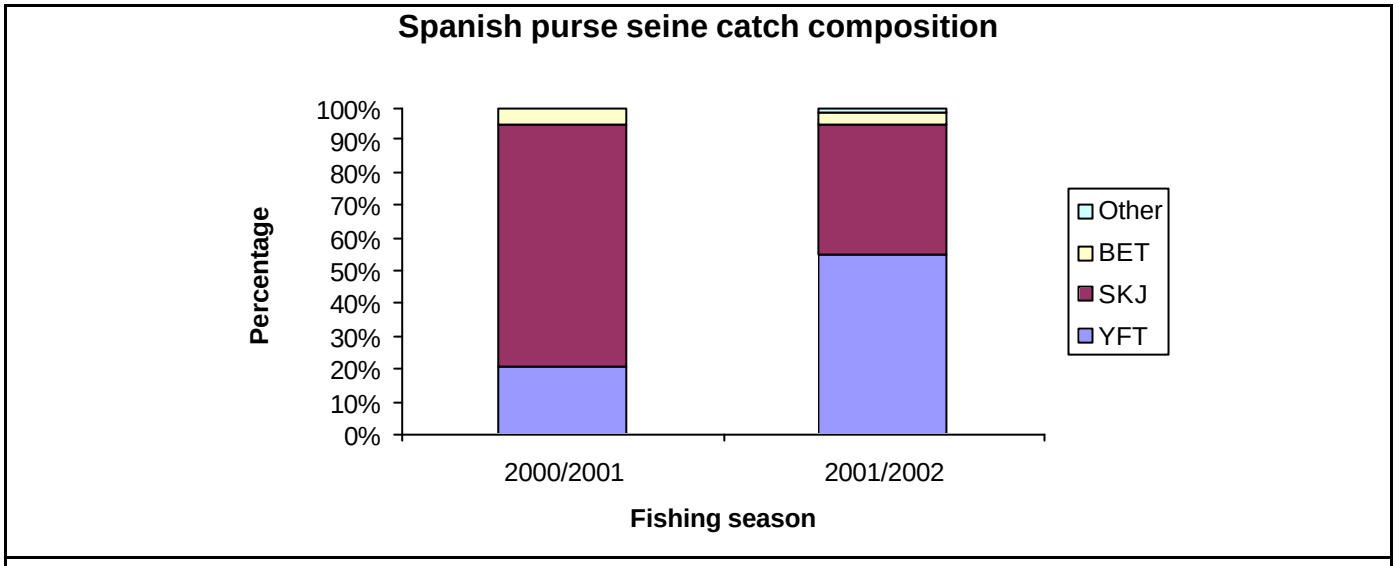

Figure 3: Spanish purse seine catch composition 2000 / 2001 and 2001 / 2002

(Source : BIOT FCMZ (Chagos Archipelago) purse seine logbooks / radio reports)

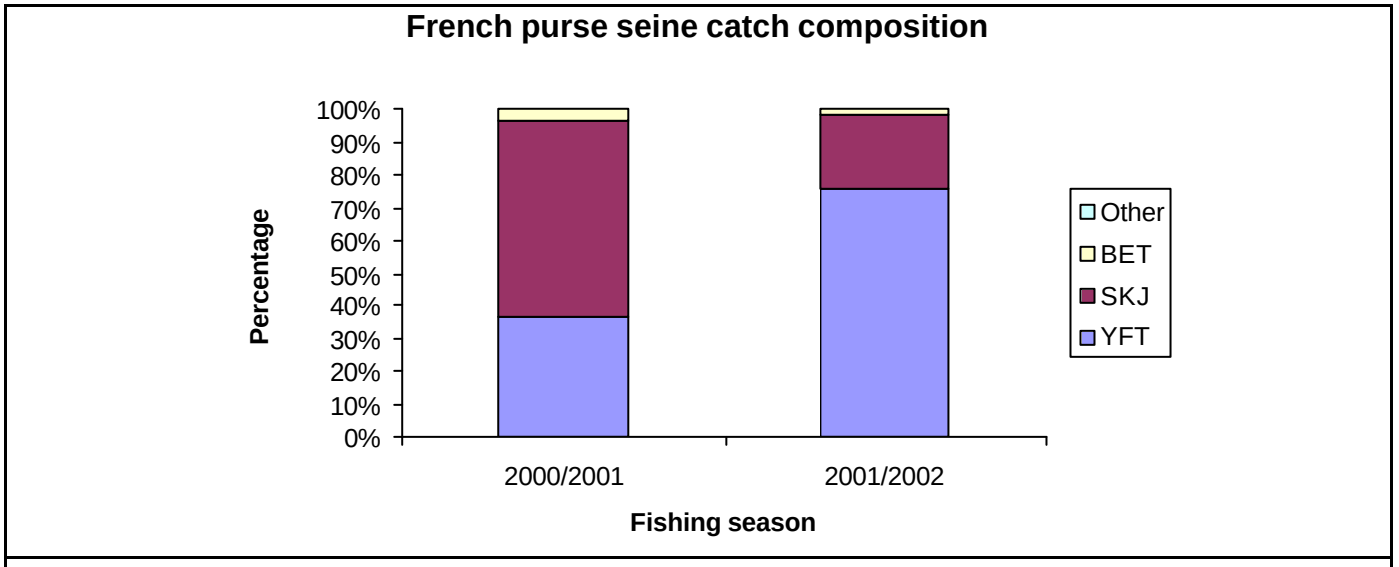

Figure 4: French purse seine catch composition 2000 / 2001 and 2001 / 2002

(Source : BIOT FCMZ (Chagos Archipelago) purse seine logbooks / radio reports)

4- - BIOT OBSERVER PROGRAMMES

The 2001/2002 BIOT tuna observer program was undertaken at a later time this year than in the past, in order to increase the chance of sampling being conducted on purse seine vessels in the zone, which had been limited in the previous few years. The tuna observer programme ran from 23rd December 2001 to 2nd February 2002.

1.1. LONGLINE OBSERVATIONS

During the observer programme, longline activity was very reduced and only one Japanese vessel was sampled during a period when she fished in the south-east of the FCMZ. The observation period lasted for 4 days, from 23rd December 2001 to the 28th December 2001.

The longline rig used was typical of a Japanese longliner, with no metal trace employed. During the observation period the vessel landed a total of 8188 kg (live weight) of target, by-catch and discard species, of which bigeye tuna composed 3792.5kg (46%) and yellowfin 721kg (8.8%). The overall catch per unit effort (CPUE) was 37.4kg / 100 hooks (or 2047 kg / day).

The major target species were bigeye tuna (*Thunnus obesus*) and yellowfin tuna (*Thunnus albacares*). Higher value by-catch species retained on board included albacore (*Thunnus alalunga*), swordfish (*Xiphias gladius*), other billfishes, blue shark (*Prionace glauca*), shortfin mako shark (*Isurus oxyrinchus*) and dorado (*Coryphaena hippurus*). All other species caught were discarded. Any fish that escaped capture on the surface or had the line intentionally cut were not recorded.

The proportion of target species combined was 22.8% by number and 55.1% by weight of the total catch. The proportion of bigeye was 18.2% by number and 46.3% by weight and the proportion of yellowfin was 4.7% by number and 8.8% by weight.

The proportion of by-catch species combined was 7.7% by number and 15.4% by weight of the total catch. Swordfish constituted 1.6% by number and 4.2% by weight, other billfish 1.6% by number and 2.0% by weight; blue shark constituted 2.6% by number and 8.1% by weight and shortfin mako shark 0.5% by number and 0.7% by weight.

The proportion of discards combined was 69.5% by number and 29.5% by weight. This figure constitutes predominantly one species, longnose lancetfish (*Alepisaurus ferox*), which has been identified in previous observer programmes as the major incidental catch species caught on longliners in this area of the Indian Ocean.

During the past two BIOT tuna observer programmes, all catches on longliners have been monitored through a system of hook surveys. These was done by two observers working as a team for a particular set, monitoring every hook hauled. The observers note the status of the hook (i.e. whether a hook is empty of occupied) and if the fish caught is retained or discarded. The vessel is requested during the hook surveys to land all fish that they would normally discard so that a complete and true species composition can be determined along with hook occupancy rates. In this way the observers can also monitor mutilation rates as these fish would be discarded before being landed otherwise.

The data from the past two years have been combined to give a detailed species composition. Although only a small number of complete hauls has been sampled, this approach should give a much better indication of the true species composition of catches of longliners in the Western Indian Ocean, as previously only target and a few limited by-catch species have been recorded.

A comparison of the combined species composition for the longlines sampled is presented in Figures 5 and 6, which show the species composition in terms of numbers of fish caught for those species normally recorded in longline logbooks and the observed species composition.

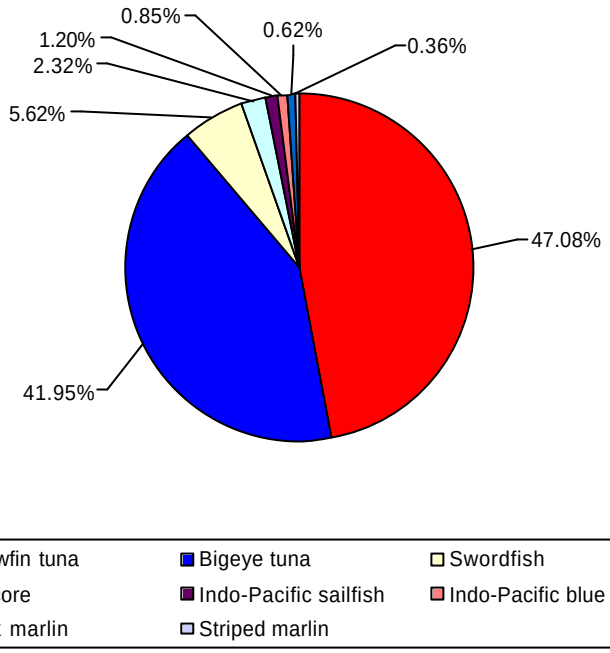

Figure 5: Species composition observed by longline hook survey sampling (logbook species only)

Source: BIOT Observer Programmes 2000 / 2001 and 2001 / 2002.

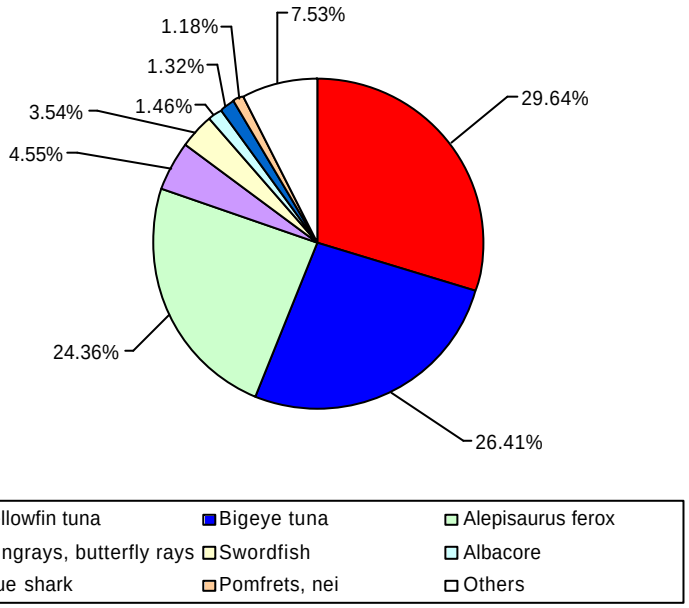

Figure 6: Species composition observed by longline hook survey sampling (all species observed)

Source: BIOT Observer Programmes 2000 / 2001 and 2001 / 2002.

It is clear from these two figures that a significant contribution to the species composition in terms of numbers and to a lesser extent weight is made by the long-nose lancet fish (*Alepisaurus ferox*), which makes up 24.36% of the fish caught by number. This may have a significant effect on any stock assessment of the tuna stocks using longline CPUE series, as the number of hooks available to catch target species is lower than previously thought as a number of hooks are occupied by non-target species that are routinely shaken off the hooks before they can be landed.

1.2. PURSE SEINE OBSERVATIONS

A total of 61 days observation on seven different Spanish purse seine vessels were undertaken during the 2001 / 2002 tuna observer programme. The overall observed CPUE was 22.2 t/day. Setting efficiency was lower than the previous two seasons, which may be due to the large number of sets made this season on free shoaling fish, where often the predictability of

successful sets are lower. Only three sets were made on FADs (Fish Aggregation Devices) and they were all 100% successful in producing catches.

During the 2001 / 2002 season purse seine vessels were seen to exploit three distinct length classes of yellowfin tuna, 35-36cm, 52-54cm and 137-139cm. The former two associated with FAD sets and the latter one from free shoals sets. Bigeye tuna sampled also displayed three distinct length classes, 32-36cm and 52-54cm from FAD sets, and 140-146cm from free shoals. Single species free shoals were caught this season, an occurrence not observed over the last 2 years. Skipjack tuna were caught exclusively on FAD sets and displayed two length classes, 45-47cm and 56-60cm. No skipjack tuna were observed in mixed free shoaling catches, an occurrence often observed in previous seasons.

A number of albacore were present in small numbers in the catches of free shoaling yellowfin tuna. Length classes of 101-102cm and 109-110cm were recorded. This trend has not been observed since the 1998-1999 season.

1.3. BIOLOGICAL OBSERVATIONS

Length-weight relationships were recorded for the target tuna species. And for the four main discard species observed on longliners and purse seiners collectively, dorado, pelagic thresher shark, silky shark and long-nosed lancet fish.

Sex and maturity data was collected on 271 fish from the target tuna species. Sampling was undertaken on both longliner and purse seine vessels. A total of 153 yellowfin tuna were sampled for sex and maturity on longliners and purse seine vessels. The results showed that 54.2% were female and 45.8% were male. The majority of males were at stage V on the maturity scale used and the majority of females were at stages IV and V.

A total of 81 bigeye tuna were sampled for sex and maturity on longliners. 71.6% were male and 28.4% found to be female. The majority of males were at stage IV and V, and the majority of females stage V. The proportion of males and females observed at stage VI and VII suggest that a proportion of males reach spawning condition slightly earlier than females. The data displays similar trends with previous years in that bigeye spawn slightly earlier in the season than yellowfin.

Only 37 skipjack were sampled from purse seine vessels, with 56.8% found to be male and 43.2% female. All skipjack were of maturity stage III and above. The majority of males were maturity stage IV and V. All females were maturity stage IV and V. Again, the occurrence of maturity stage VI and VII males suggests that a proportion of males reach spawning condition ahead of females.

Sex and maturity analysis was undertaken on four by-catch and discarded shark species on longliners and purse seine vessels. A total of 11 blue shark (27.3% female, 72.7% male), 19 silky shark (47.4% female, 52.6% male), 12 pelagic thresher shark (41.7% female, 58.3% male) and 8 crocodile sharks (25% female, 75% male) were sampled.