9. 概 要

アマゾン河口域は、アマゾン河の厖大な量の河川水と大西洋の海水が混合する海域であり、その水産資源の潜在漁業生産力は高く、優良な漁場として期待されてきた。1960 年末にブラジル国政府の奨励により設立された企業漁業は、当海域でピラムターバを対象とした大型底曳網漁業を発展させてきたが、その漁獲量は 1977 年を最大にそれ以降減少してきており、ピラムターバ資源に対する過剰な開発が指摘されている。しかし、現在に至るまでアマゾン河口域のピラムターバをはじめ主要な商業重要種の資源に関する調査・研究はなされていない。このためブラジル国は、アマゾン河口域の水産資源の現況評価と持続的な利用を重要な課題として位置づけ、1994 年にそれに係わる調査の実施を日本国に要請した。このような状況の下で1996年と1997年の各々の雨季と乾季に日本国国際協力事業団、パラエンセ・エミリオ・ゲルディ博物館/国家科学技術推進審議会、ブラジル環境・再生天然資源院の三者の共同で、アマゾン河口水産資源調査（この調査は(1)海上調査、(2)研究室での調査、(3)陸上調査から構成される）が実施された。第 1 回目の調査にあたる 1996 年の雨季では、陸上調査は計画通りに実施されたが、他の 2 つの調査はブラジル国内の諸事情により中止となった。この調査により初めて雨季と乾季におけるアマゾン河口域の底生魚類相、重要魚種の分布と資源量と生物学的知見、漁業実態等のまとまった資料が得られた。以下にこれら資料の解析結果の概要を示す。

1-1) 海上調査は、日本国国際協力事業団、パラエンセ・エミリオ・ゲルディ博物館、ブラジル環境・再生天然資源院の三者が共同し、日本国国際協力事業団用船のマリル（75GRT）とクルスタマルV（99GRT）を用いて実施された。調査期間は、乾季の調査では 1996 年 8 月 8 日－9 月 30 日の 43 日間および 1997 年 8 月 8 日－9 月 26 日の 37 日間、そして雨季の調査では 1997 年 3 月 7 日－4 月 28 日の 42 日間であった。調査内容は、資源調査、生物学的調査、海洋学的調査等であった。資源調査のトロール操業は、層化無作為抽出法によって配置された定点上で、前述の 2 隻の調査船 1 組で各々111 回、120 回、120 回実施された。

1-2) 魚種数と魚種毎の個体数から底生魚類群集の種組成と多様性を解析し、さらに底生魚類群集を類似度指数に基づき群別化した。

1-3) 全魚種の CPUA（単位面積当たりに標準化された漁獲重量）の分布様式を解析し、さらにそれら CPUA を層別・水塊別に分析し、その上位魚種を析出した。

1-4) 全魚種の全体および層別の資源量を面積・密度法によって推定し、それら資源量の上位魚種を抽出した。

1-5) アマゾン河口域における重要魚種であるピラムターバ、ドラーダ、フィリョッテ、ペスカーダ・ブランカ、ペスカーダ・アマレーラ、オオカミニベ、グリジューバの CPUA の分布様式を解析し、さらにそれら CPUA を層別・水塊別に分析した。

1-6) 面積拡大法（面積・密度法）によって推定された重要 7 魚種の資源量を評価した。

1-7) 重要 7 魚種の体長組成、体長-体重関係、性比、雌の成熟状況、食性等の生物学的知見を得た。

1-8) ピラムターバとオオカミニベの現行トロール網に対する網目選択制を解析した。

1-9) T-S 値分布から区分された 4 つの水塊（河川水、海洋水、表層高温水、混合水）の分布を解析した。また、底生魚類の環境塩分、表層 pH、流れ、海上気象に関する知見を得た。

2-1) 研究室での調査は、日本国国際協力事業団、パラエンセ・エミリオ・ゲルディ博物館、ブラジル環境・再生天然資源院の三者が共同し、パラエンセ・エミリオ・ゲルディ博物館動物学研究部魚類学研究室において 1996 年 2 月 18 日－4 月 19 日の 62 日間、1996 年 9 月 9 日－11 月 1 日の 54 日間、1997 年 4 月 2 日－5 月 21 日の 50 日間、1997 年 9 月 5 日－11 月 6 日の 63 日間に亘って実施した。調査内容は、主に海上調査で得た重要魚種の年齢形質の標本処理・作成および輪紋の測定であった。

2-2) 重要 7 魚種の年齢形質として五つの硬組織（棘条、椎体、耳石、鱗、鰓蓋骨）を比較検討して魚種毎の最適な年齢形質とその採取部位を選定した。

2-3) 重要 7 魚種について年齢形質の大きさと体長との相関関係を三つの回帰式によって求め、両者の適合性が良い式を選定した。

2-4) 重要 7 魚種の年齢形質に形成される輪紋に関する個体間の対応性を輪群別の椎体または耳石の半径と輪紋半径との関係等から解析した。

2-5) 重要 7 魚種の輪紋の形成時期およびその周期性を輪群別の縁辺成長率 α を用いて推定した。

2-6) 重要7魚種の硬組織による年齢査定は困難であったことから、なぜそれらの輪紋が年齢の表示になりえないのか、若干の考察を行った。

2-7) 重要7魚種の輪紋は明確な年齢の特徴でないものと推察されたため、重要7魚種のうち、コホート解析が可能な体長組成データが得られた4魚種について、コホート解析による同一発生群の抽出を試みた。

2-8) コホート解析によって分離された各コホートの平均体長（モード体長）に基づく定差図からそれらモードの周期性を解析した。

3-1) 陸上調査は、日本国国際協力事業団とパラエンセ・エミリオ・ゲルディ博物館の共同で、1996年2月27日－4月2日の36日間、1996年8月5日－9月7日の34日間、1997年3月3日－3月24日の22日間、1997年8月4日－8月12日の7日間に亘って実施された。調査内容は、水産統計等の資料収集、水産業実態の聞き取り、水揚げ場所における重要魚種の体長測定であった。

3-2) 水産統計などの資料から最近のブラジル、ブラジル北部、パラ州の水産業動向を、特にパラ州における企業漁業によるピラムタ…バの生産と流通に注目して解析した。

3-3) アマゾン河口域に散在する市町村の漁港を中心に聞き取られたデータから当地の水産業の実態を解析した。

3-4) 各地の水揚げ場所で穿孔法によって得られた重要魚種の体長組成を解析した。

3-5) これらの解析結果から、アマゾン河口域の水産経済が内在する問題点を抽出した。

4) アマゾン河口域の既開発水産資源を海上調査および陸上調査の解析結果などを基に評価した。

5) アマゾン河口域の未利用水産資源と未開発水産資源を海上調査および陸上調査の解析結果等を基に評価した。

6) アマゾン河口域の底魚漁業資源の管理に関して、資源生物学的と社会経済学的の二つの観点からその指針を提言し、またこれらの提言とともに水産資源の合理的利用と漁業管理の方向を勧告した。

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付表 1. 漁獲魚種一覧. Local and FAO names in round and square brackets are not available in each category.

Order name	Fmily name	Species	Local name	FAO name	Phase 1	Phase 2	
					Dry Season	Rainy Season	Dry Season
Carcharhiniformes	Carcharhinidae	*Carcharhinus limbatus*	Cação-galha-preta	Blacktip shark		○	
		Carcharhinus porosus	Cação	Smalltail shark	○	○	○
		Isogomphodon oxyrhynchus	Cação-bico-de-pato	Daggernose shark	○	○	
		Sphyrna lewini	Martelo	Scalloped hammerhead		○	
		Sphyrna tiburo	Cação-rodela	Bonnethead	○	○	○
		Sphyrna tudes	Cação-rodela, Martero	Smalleye hammerhead	○	○	○
Rajiformes	Pristidae	*Pristis microdon*	Espadarte	Largetooth sawfish	○		
	Torpedinidae	*Narcine brasiliensis*	Arraia-elétrica	Brazilian electric ray	○	○	○
	Dasyatidae	*Dasyatis geijkesi*	Arraia-morcego, Anjo	Sharpsnout stingray	○	○	○
		Dasyatis guttata	Arraia-bicuda	Longnose stingray	○	○	○
		Himantura schmardae	Arraia-redonda	Chupare stingray	○	○	
		Plesiotrygon spp.	Arraia	[Freshwater stingray]		○	○
		Urotrygon microphthalmum		-			○
	Gymnuridae	*Gymnura micrura*	Arraia	Smooth butterfly ray	○	○	○
	Myliobatidae	*Aetobatis narinari*	Jamanta-cara-de-gente	Spotted eagle ray	○	○	○
		Rhinoptera bonasus	Arraia	Cownose ray		○	
Elopiformes	Elopidae	*Elops saurus*	Ubarana	Ladyfish		○	
	Megalopidae	*Tarpon atlanticus*	Pirapema, Camurupim	Tarpon	○		
Anguilliformes	Ophichthidae	*Ahlia egmontis*	Cobra-enguia-pequena	-	○		
	Muraenesocidae	*Cynoponticus savanna*	Moréia	Guiana pike-conger		○	
Clupeiformes	Engraulidae	*Anchoa spinifer*	(Manjuba-savelha)	Spicule anchovy	○	○	○
		Anchoviella sp.		-		○	○
		Engraulidae		Anchovies	○	○	○
		Lycengraulis batesii	(Sardinha-prata)	Bates' sabretooth anchovy		○	○
	Pristigasteridae	*Chirocentrodon bleekerianus*	Sardinha	Dogtooth herring			○
		Odontognathus mucronatus	Sardinha-gato	Guiana longfin herring	○	○	○
		Pellona flavipinnis	Sarda, Apapá-branco	Yellowfin river pellona	○	○	○
		Pellona harroweri	Sardinha-chata	American coastal pellona	○	○	○
	Clupeidae	*Opisthonema oglinum*	Sardinha, (Sardinha-azul)	Atlantic thread herring		○	
Siluriformes	Ariidae	*Arius couma*	Bagre-branco	Couma sea catfish	○	○	○
		Arius grandicassis	Cambéua	Thomas sea catfish	○	○	○

Appendix Table 1. Continued

Order name	Fmily name	Species	Local name	FAO name	Phase 1	Phase 2	
					Dry Season	Rainy Season	Dry Season
Siluriformes	Ariidae	*Arius parkeri*	Gurijuba	Gillbacker sea catfish	○	○	○
		Arius phrygiatus	Canguito, Cangatá-branco, Jurupiranga-doce	Kukwari sea catfish	○	○	○
		Arius proops	Uritinga	Crucifix sea catfish	○	○	○
		Arius quadriscutis	Cangatá	Bressou sea catfish	○	○	○
		Arius rugispinis	Jurupiranga	Softhead sea catfish	○	○	○
		Bagre bagre	Bandeirado	Coco sea catfish	○	○	○
		Cathorops spixii	Uricica	Madamango sea catfish	○	○	○
	Doradidae	*Centrodoras brachiatus*	Bacu-rato	-	○	○	○
		Lithodoras dorsalis	Bacu-pedra	-	○	○	
	Ageneiosidae	*Ageneiosus ucayalensis*	Mandubé	[Bottlenose catfish]	○	○	○
	Auchenipteridae	*Pseudauchenipterus nodosus*	Cataí	Cocosoda catfish	○	○	○
	Pimelodidae	*Brachyplatystoma filamentosum*	Filhote, Piraíba	Kumakuma catfish	○	○	○
		Brachyplatystoma flavicans	Dourada	[Gilded catfish]	○	○	○
		Brachyplatystoma vaillantii	Piramutaba	Laulao catfish	○	○	○
		Goslinia platynema	Babão	[Slobberer]		○	
		Pimelodus sp.	Mandi	-	○	○	○
	Hypophthalmidae	*Hypophthalmus marginatus*	Mapará	Highwaterman catfish		○	
	Aspredinidae	*Aspredinichthys filamentosos*	Rabeca	Sevenbarbed banjo	○	○	○
		Aspredo aspredo	Rabeca	Banjo	○	○	○
Gymnotiformes	Rhamphichthyidae	*Rhamphichthys* sp.	Ituí-terçada	[Knifefish]		○	
	Apteronotidae	*Sternarchella* sp.	Sarapó	[Knifefish]	○	○	○
Batrachoidiformes	Batrachoididae	*Batrachoides surinamensis*	Pacamão	Pacuma toadfish	○	○	○
		Porichthys plectrodon	Miqui	Atlantic midshipman			○
Lophiiformes	Ogcocephalidae	*Ogcocephalus* sp.	Peixe-morcego	[Batfish]			○
Mugiliformes	Mugilidae	*Mugil incilis*	Tainha	Parassi mullet			○
Perciformes	Centropomidae	*Centropomus parallelus*	Camorim, (Camorim-tapa,	Fat snook	○	○	○
		Centropomus pectinatus	Camorim, (Camorim-sovela)	Tarpon snook	○	○	○
		Centropomus undecimalis	Camorim, (Camorim-açu)	Common snook		○	○
	Serranidae	*Epinephelus itajara*	Mero	Jewfish	○	○	○

Appendix Table 1. Continued

Order name	Fmily name	Species	Local name	FAO name	Phase 1	Phase 2	
					Dry Season	Rainy Season	Dry Season
Perciformes	Serranidae	*Serranus atrobranchus*	(Mariquita)	-	○		
	Echeneidae	*Echeneis naucrates*	Piolho-de-tubarão, Rémora	Live sharksucker	○	○	
	Carangidae	*Chloroscombrus chrysurus*	Xaréu	Atlantic bumper	○	○	
		Hemicaranx amblyrhynchus	Palombeta-do-alto	Bluntnose jack	○	○	○
		Oligoplites sp.		-			○
		Oligoplites palometa	Timbira, Pratiuira	Maracaibo leatherjack	○	○	○
		Oligoplites saurus	Timbira	Atlantic leatherjack	○		○
		Selene setapinnis	Galo, (Galo-legítimo)	Atlantic moonfish	○		
		Selene vomer	Galo, (Galo-de-fita)	Atlantic look down	○	○	○
		Trachinotus carolinus	Pampo	Florida pompano		○	
		Trachinotus cayennensis	Pampo	Cayenne pompano		○	
	Lobotidae	*Lobotes surinamensis*	Cará-açu	Atlantic tripletail	○		
	Haemulidae	*Genyatremus luteus*	Coró,Peixe-pedra	Torroto grunt	○	○	○
		Orthopristis ruber	(Corcoroca-jurumirim)	Corocoro grunt	○		
	Polynemidae	*Polydactylus virginicus*	Piraquara	Barbu			○
	Sciaenidae	*Ctenosciaena gracilicirrhus*	Curucala	Barbel drum	○		
		Cynoscion sp.		-	○		
		Cynoscion steindachneri	(Pescada-jaguara)	Smalltooth weakfish	○	○	○
		Cynoscion acoupa	Pescada-amarela	Acoupa weakfish	○	○	○
		Cynoscion virescens	Pescada-cambuçu	Green weakfish	○	○	○
		Isopisthus parvipinnis	Falsa-gó, Goete	Shortfin corvina	○	○	○
		Larimus fasciatus	(Oveva)	-		○	
		Lonchurus lanceolatus	Pescada-flamengo	Longtail croaker	○	○	○
		Macrodon ancylodon	Pescadinha-gó	King weakfish	○	○	○
		Micropogonias furnieri	Pescada-curuca-grande	Whitemouth croaker	○	○	○
		Nebris microps	Pescada-sete-buchos	Smalleye croaker	○	○	○
		Paralonchurus brasiliensis	Pescada-flamengo-pequena	Banded craoker	○	○	○
		Plagioscion auratus	Pescada-cascuda-preta	-	○	○	○
		Plagioscion squamosissimus	Pescada-branca	-	○	○	○
		Stellifer microps	Pescada-curuca-pequena	Smalleye stardrum	○	○	○

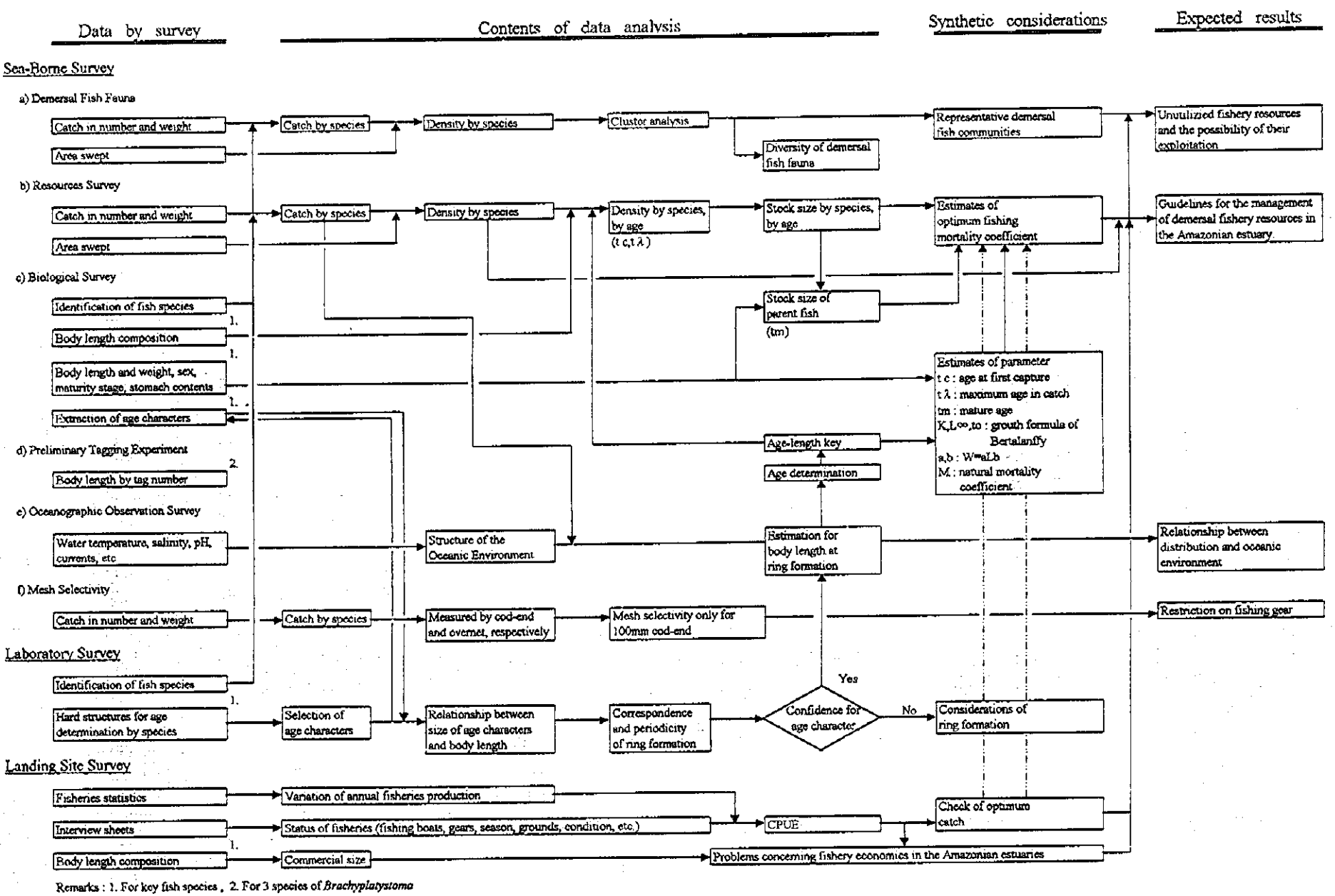
Appendix Table 1. Continued

Order name	Fmily name	Species	Local name	FAO name	Phase 1	Phase 2	
					Dry Season	Rainy Season	Dry Season
Perciformes	Sciaenidae	*Stellifer rastrifer*	Buchudinho	Rake stardrum	○	○	○
	Gobiidae	*Gobioides broussonnetii*	Amuré	-			○
		Gobioides grahamae	Amuré	-	○	○	○
	Ephippidae	*Chaetodipterus faber*	Paru	Atlantic spadefish	○	○	○
	Sphyraenidae	*Sphyraena guachancho*	Barracuda, Bicuda	Guaguanche	○		
	Trichiuridae	*Trichiurus lepturus*	Espada	Largehead hairtail	○	○	○
	Scombridae	*Scomberomorus brasiliensis*	Serra	Serra spanish mackerel	○	○	○
	Stromateidae	*Peprilus paru*	Gostoso	American harvestfish	○	○	○
Pleuronectiformes	Bothidae	*Bothus robinsi*	Xula	Twospot flounder	○		
		Citharichthys sp.	Xula	-	○		
	Soleidae	*Achirus achirus*	Xula, Solha	Drad sole	○	○	○
		Apionichthys dumerili	Xula	Longtail sole		○	
Tetraodontiformes	Tetraodontidae	*Colomesus psittacus*	Mamaiacu	Banded puffer	○	○	○
	Diodontidae	*Chilomycterus antillarum*	Baiacu-biriba	[Spiny puffer]	○	○	○

付表2. 網目測定結果

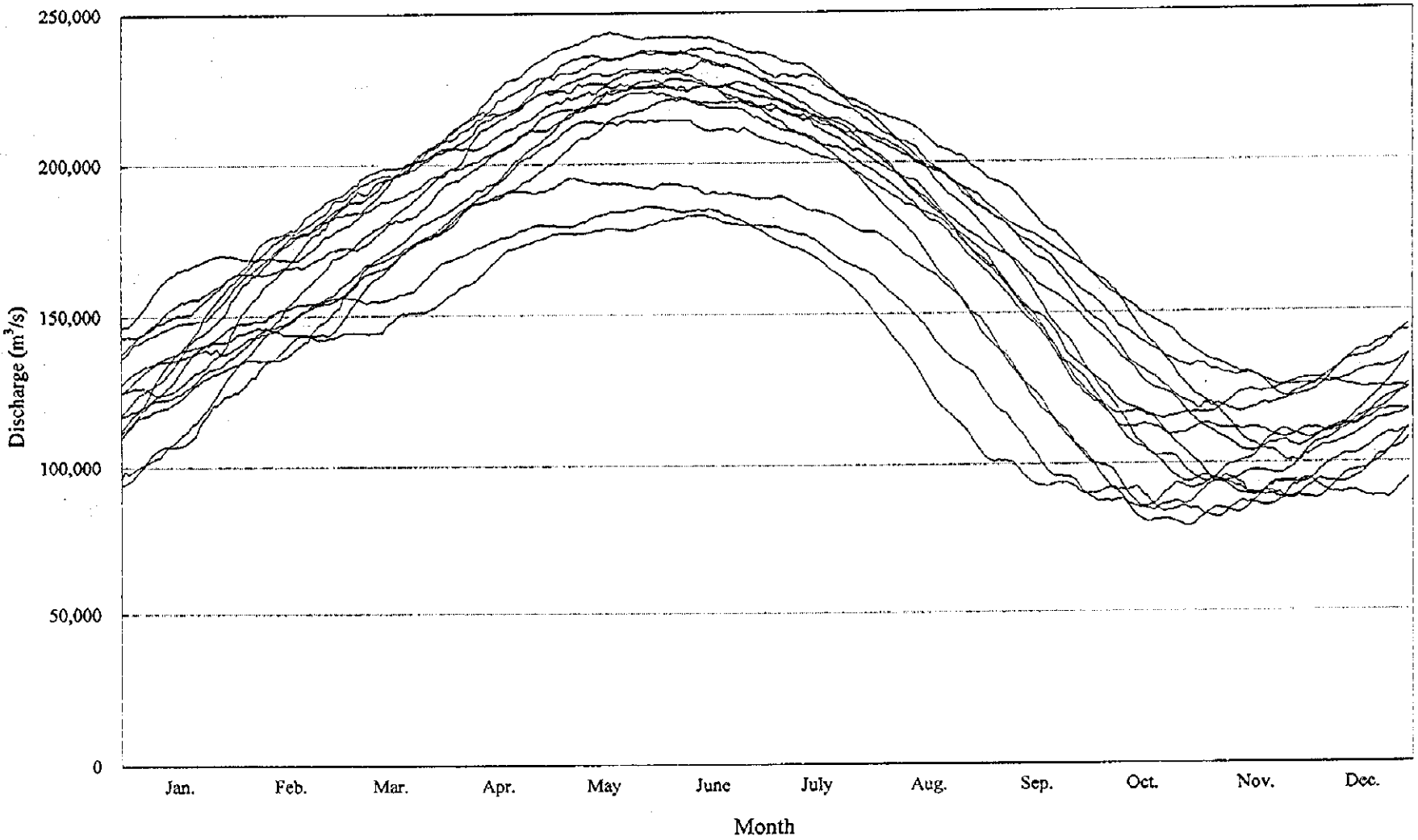
Date	7 Sep.1996				8 Apr.1997				26 Apr.1997				5 Aug.1997				25 Aug.1997			
Place	at sea				at sea				at sea				at sea				at sea			
Status of net	wet				wet				wet				wet				wet			
Measured part	upper				upper				upper				upper				upper			
Material of net	nylon				nylon				nylon				nylon				nylon			
Type of gauge	slide caliper				slide caliper				slide caliper				slide caliper				slide caliper			
Net type	covernet		cod-end		covernet		cod-end		covernet		cod-end		covernet		cod-end		covernet		cod-end	
	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd
1	35	35	93	107	36	38	100	98	34	40	87	78	35	37	87	93	36	36	81	94
2	33	37	102	103	33	35	95	95	35	34	94	97	37	35	86	99	35	39	85	92
3	33	33	105	99	36	37	92	93	34	35	92	91	34	36	87	89	35	38	80	87
4	35	35	113	100	37	38	93	95	35	36	83	91	36	35	85	94	35	36	86	95
5	35	33	88	96	37	36	92	87	35	34	83	92	35	38	95	94	35	35	86	88
6	34	35	92	97	35	41	93	91	36	34	84	91	35	36	95	94	31	37	89	98
7	33	35	99	99	36	37	96	98	36	33	91	91	34	35	81	83	35	35	83	88
8	35	39	101	98	33	37	95	89	38	32	90	91	32	38	82	89	35	34	82	93
9	37	35	82	85	34	38	90	95	36	36	90	93	35	35	91	93	35	39	92	85
10	35	35	99	94	37	38	95	92	36	35	94	87	35	36	82	90	34	36	81	89
Mean size* in mm	35	35	97	98	35	38	94	93	36	35	89	90	35	36	87	92	35	37	85	91
Standard deviation	1.00	1.12	6.92	3.84	1.58	1.58	2.77	3.62	1.18	2.18	4.29	4.94	1.32	1.20	5.11	4.94	1.35	1.72	3.87	4.12

* 2 legs and 1 knot

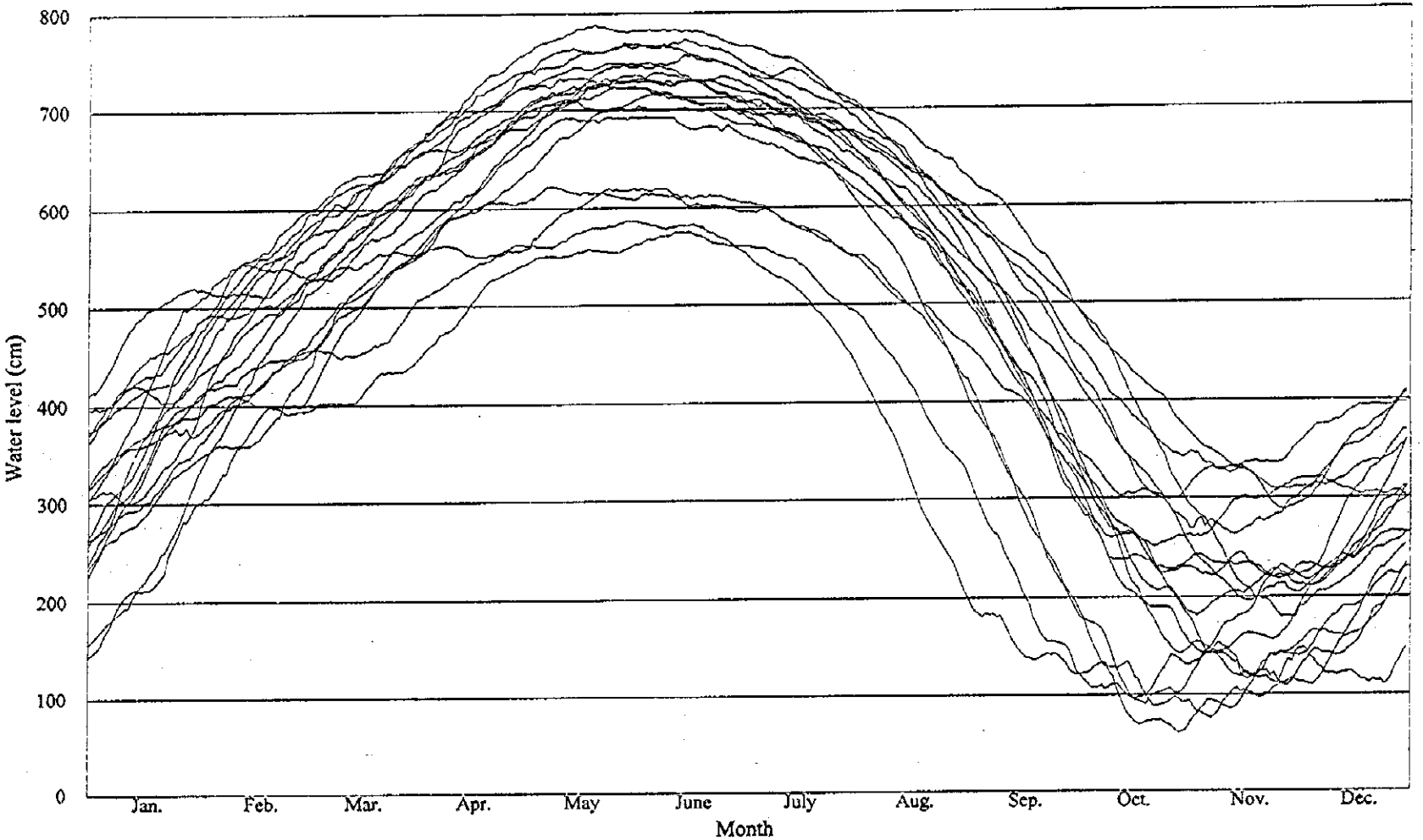


Remarks : 1. For key fish species , 2. For 3 species of *Brachyplatystoma*

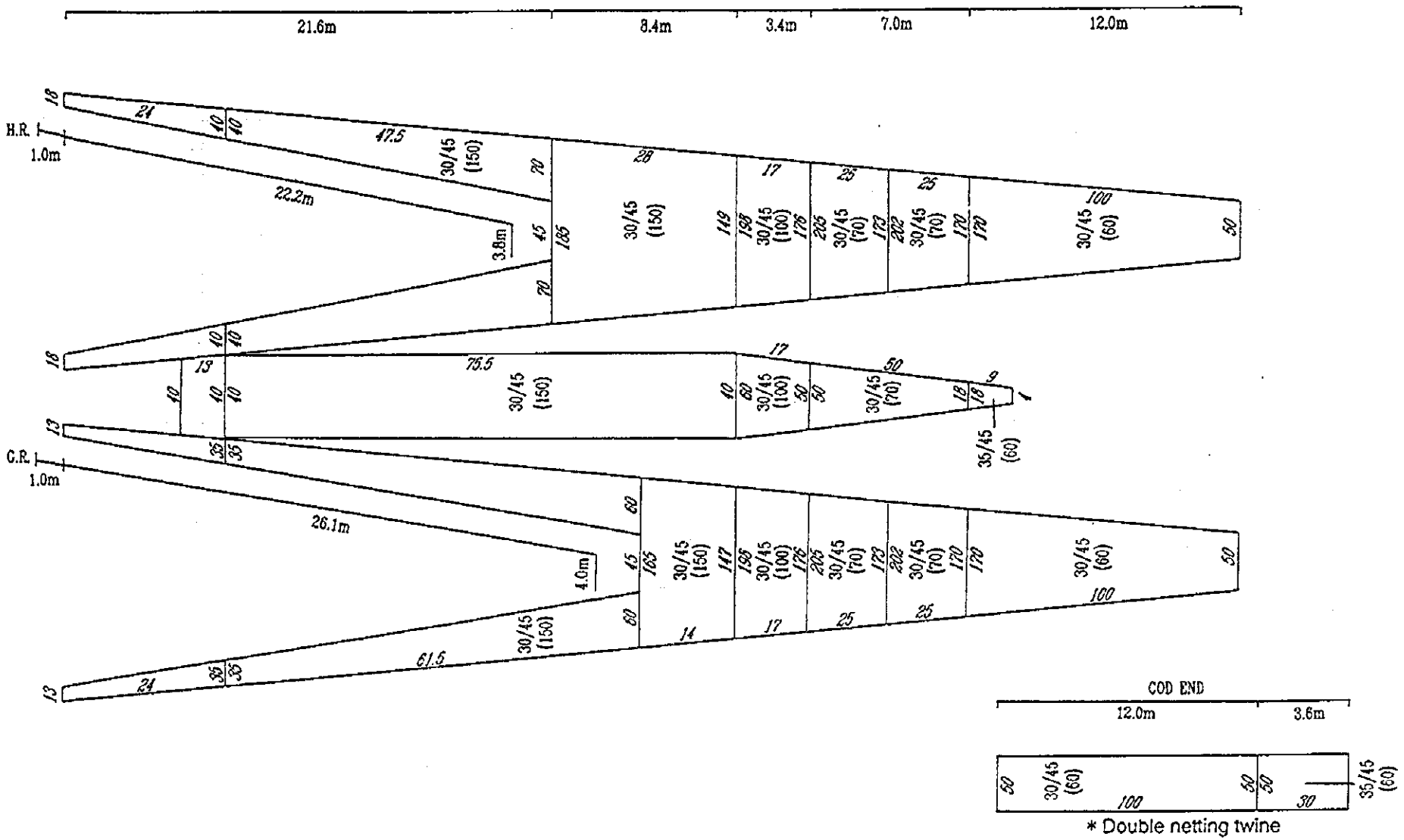
付図 1. 収得データの解析フロー



付図2. オビドスにおけるアマゾン河の1日平均流水量. (Source: MINISTERIO DAS MINAS E ENERGIA, 1970–1983).

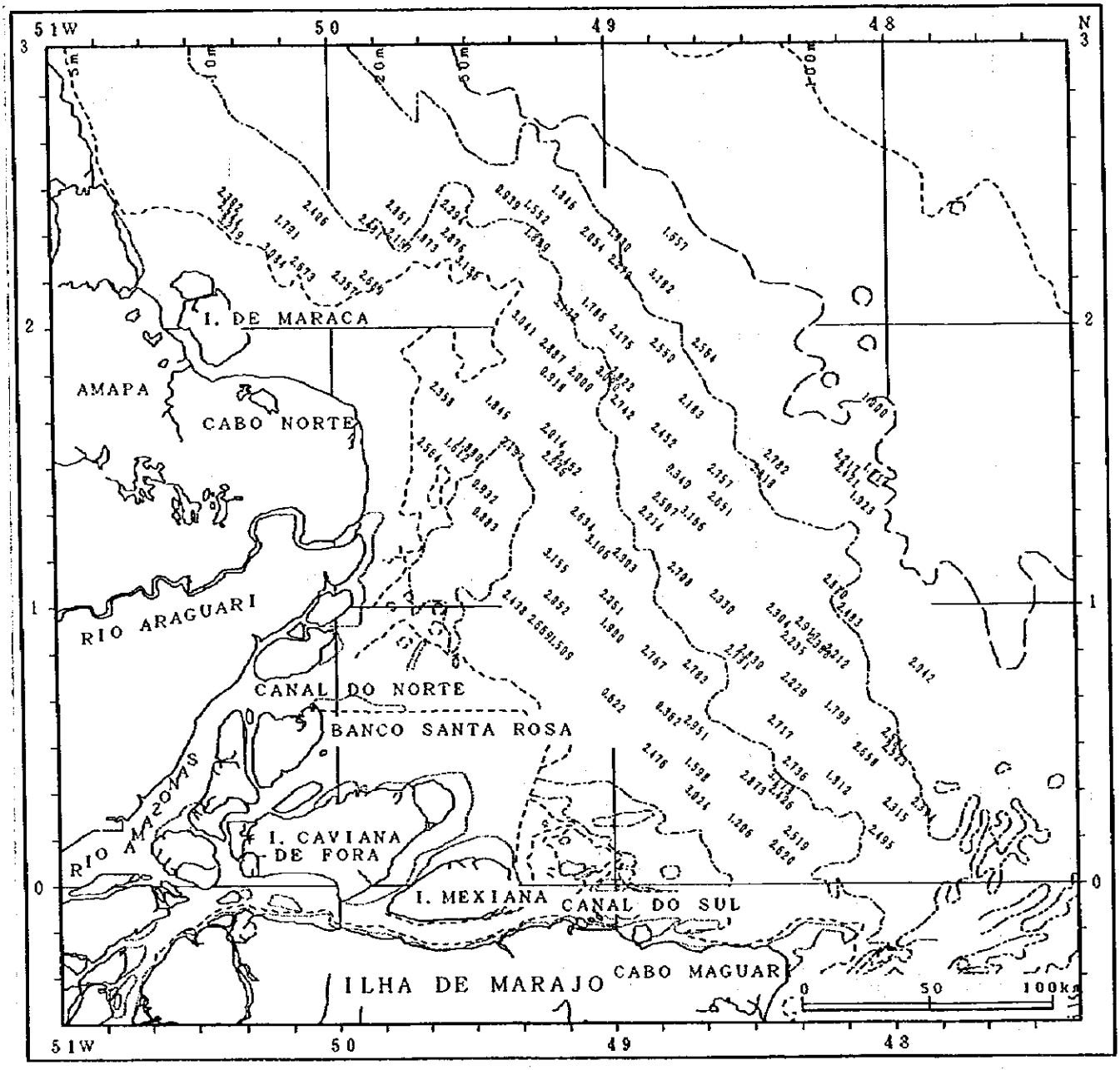


付図 3. オビドスにおけるアマゾン河の 1 日平均水位. (Source: MINISTERIO DAS MINAS E ENERGIA, 1970 - 1986).



付図 4. 調査使用漁具. Roman type indicates the number of fibres and mesh size in terms of " knot to knot " in parentheses. Italic type indicates the number of meshes.

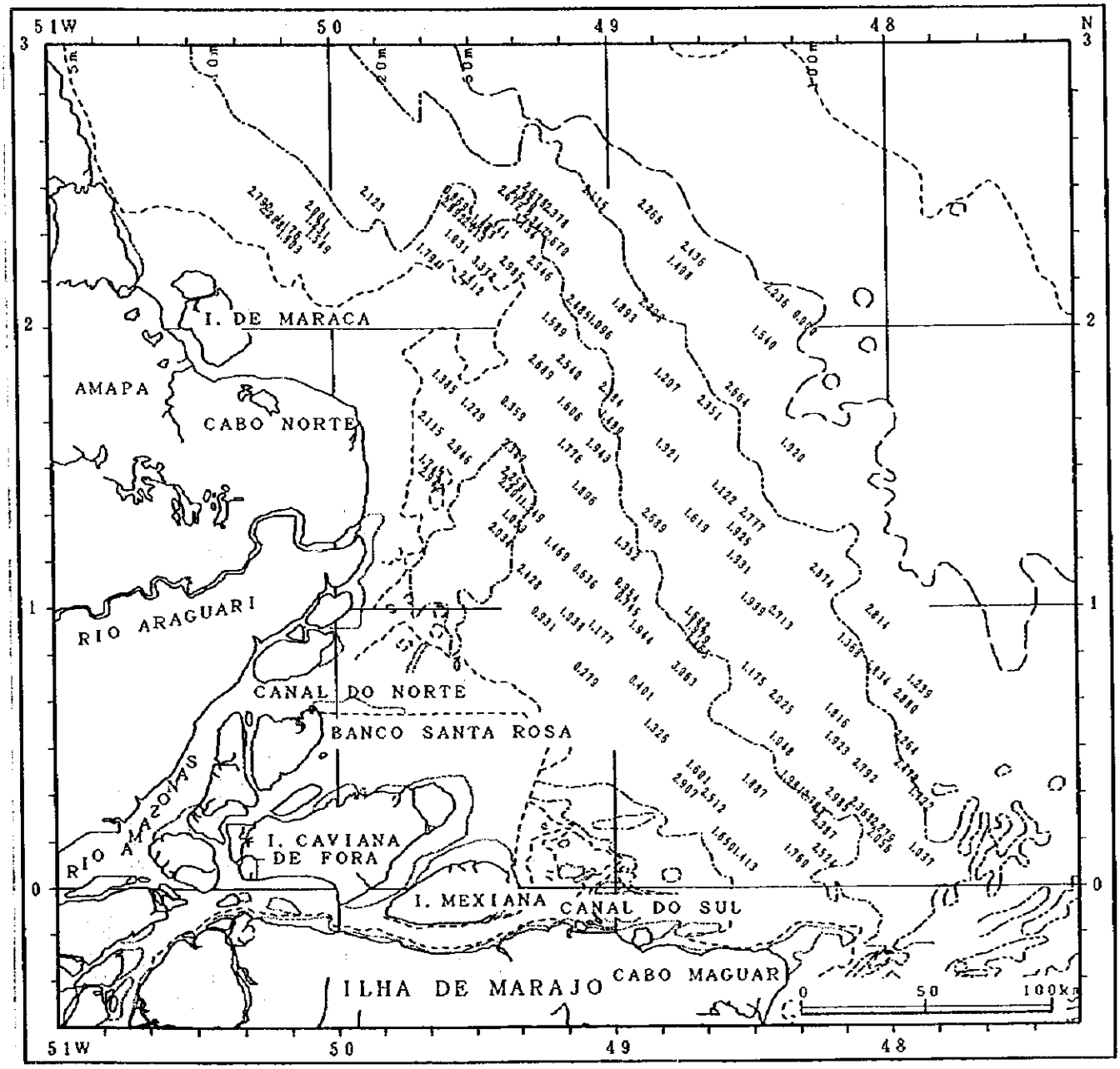
(A)



付図 5. 底生魚類群集の多様度指数 H' の水平分布. (A) 第 1 フェーズ乾季調査; (B) 第 2 フェーズ雨季調査; (C) 第 2 フェーズ乾季調査.

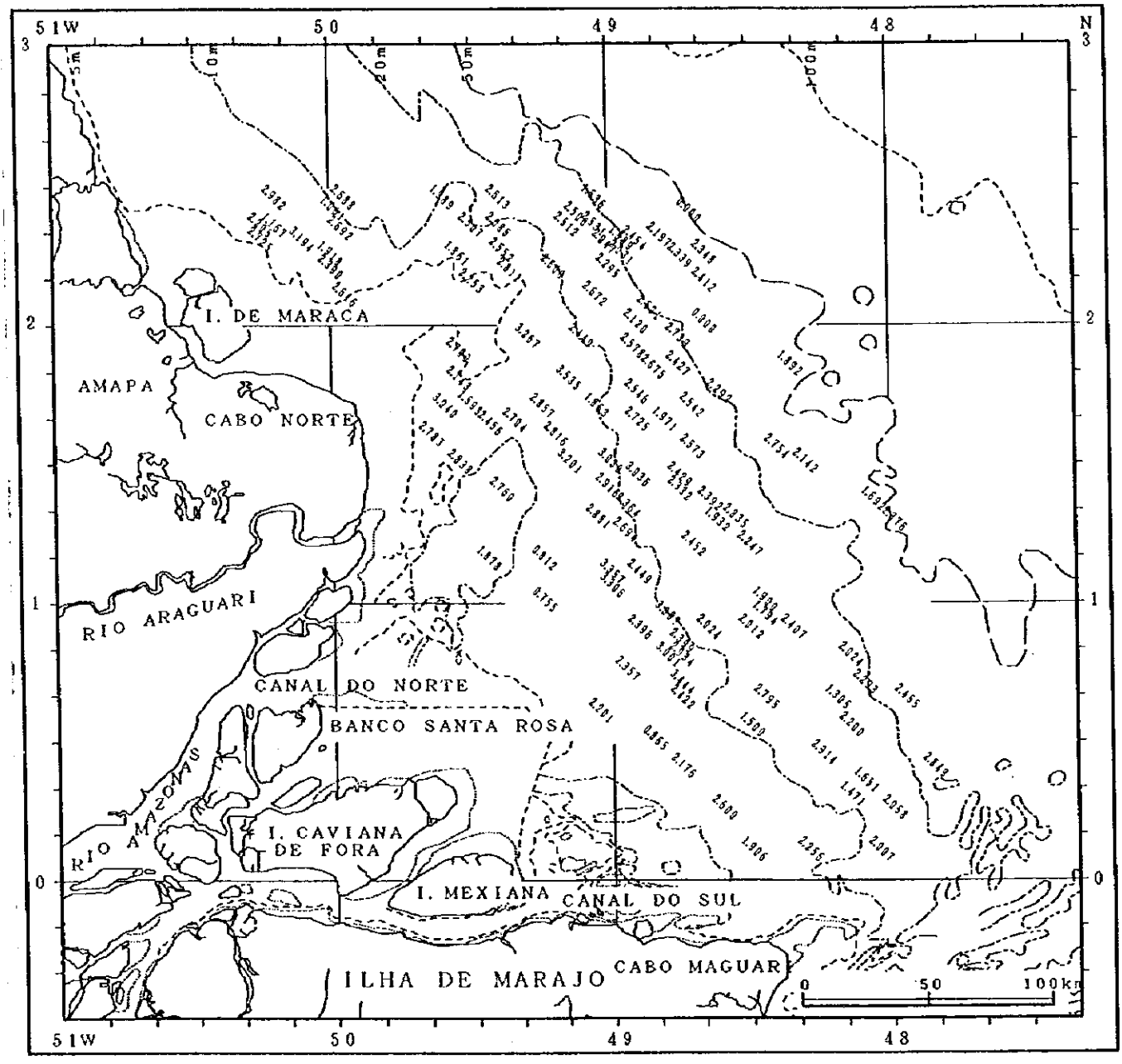
Appendix Figure 5. Continued

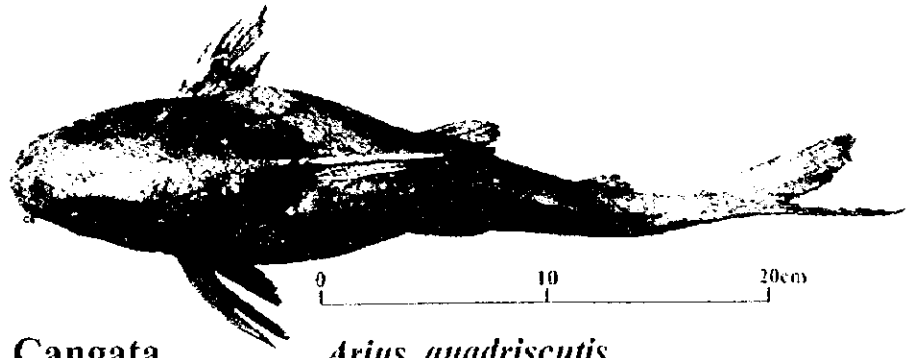
(B)



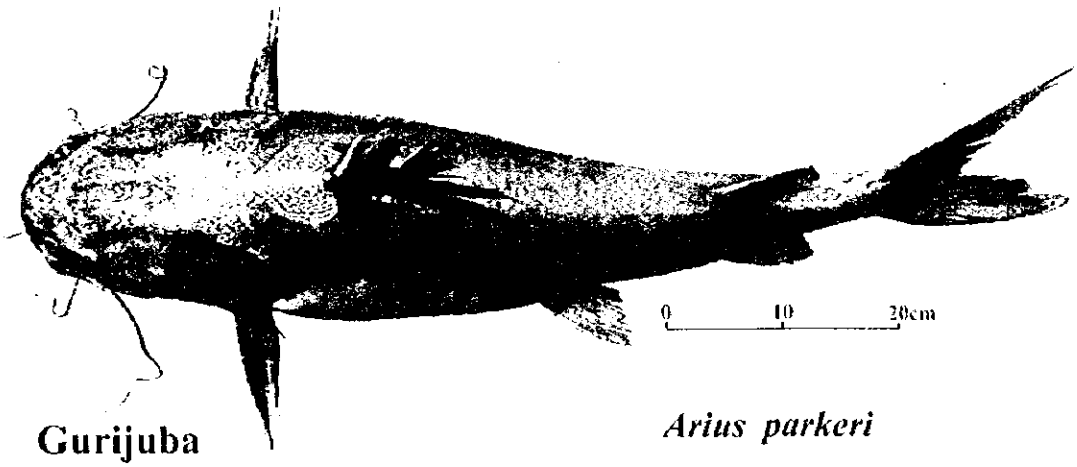
Appendix Figure 5. Continued

(C)

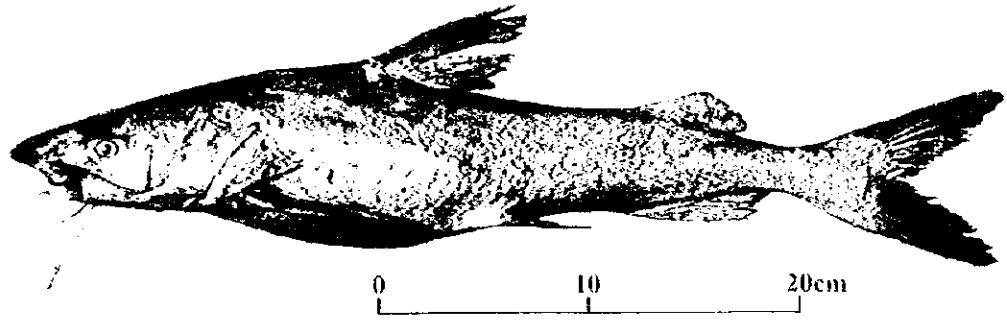




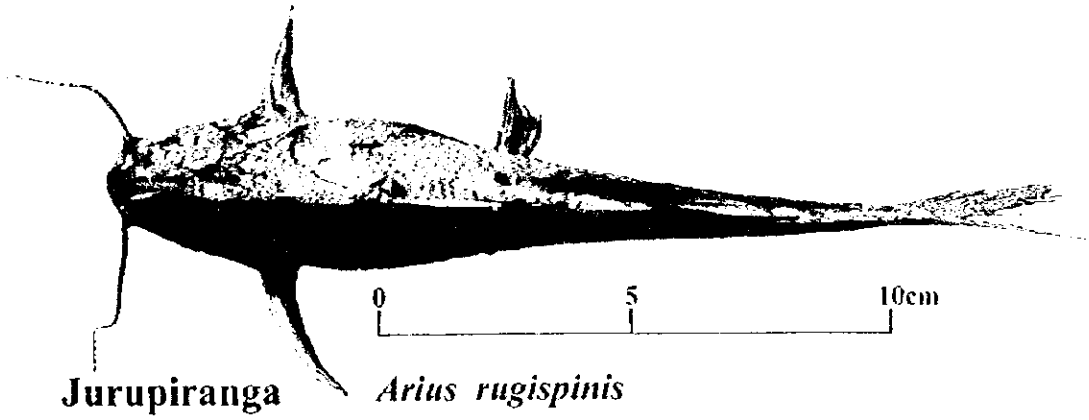
Cangata *Arius quadriscutis*



Gurijuba *Arius parkeri*



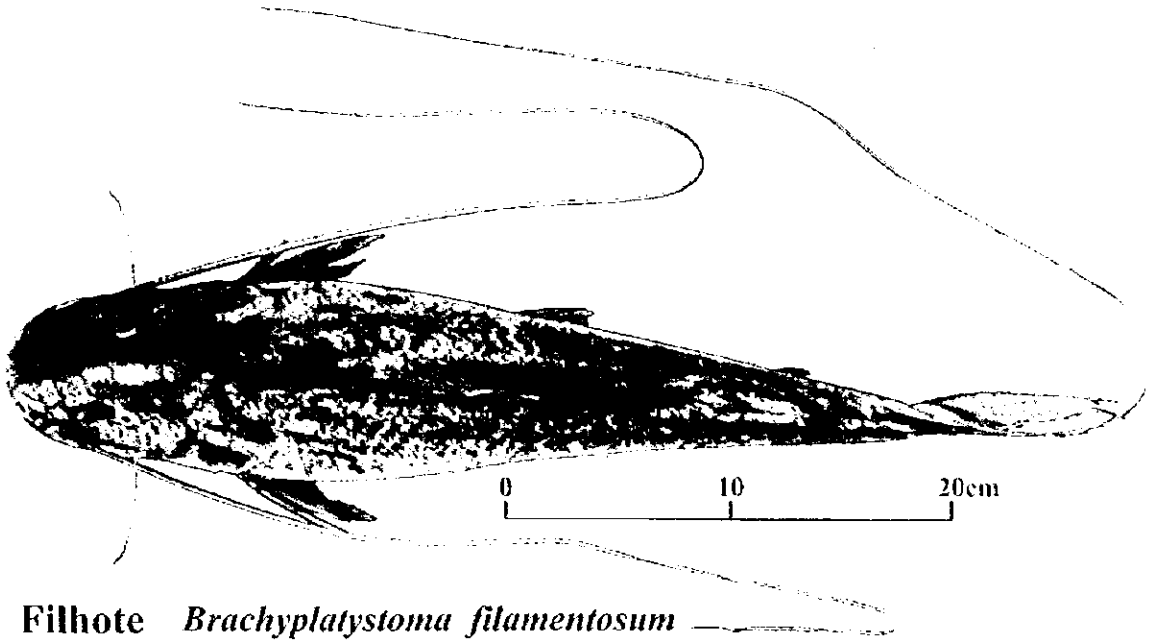
Cambeua *Arius grandicassis*



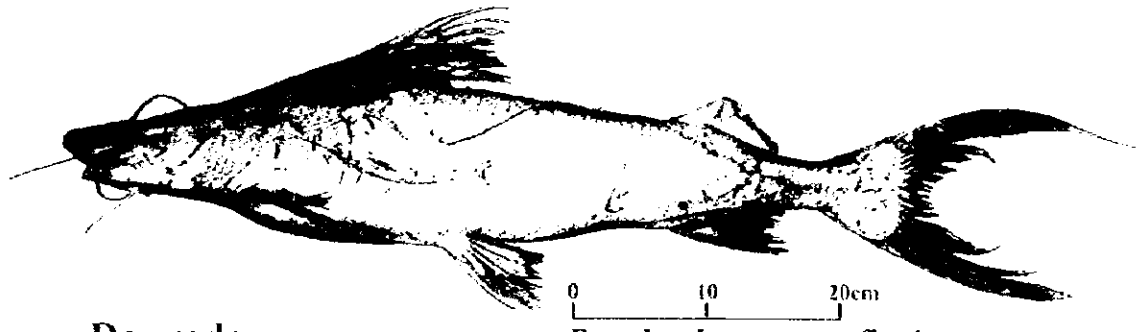
Jurupiranga *Arius rugispinis*

Plate 1. 重要魚種および資源量上位魚種

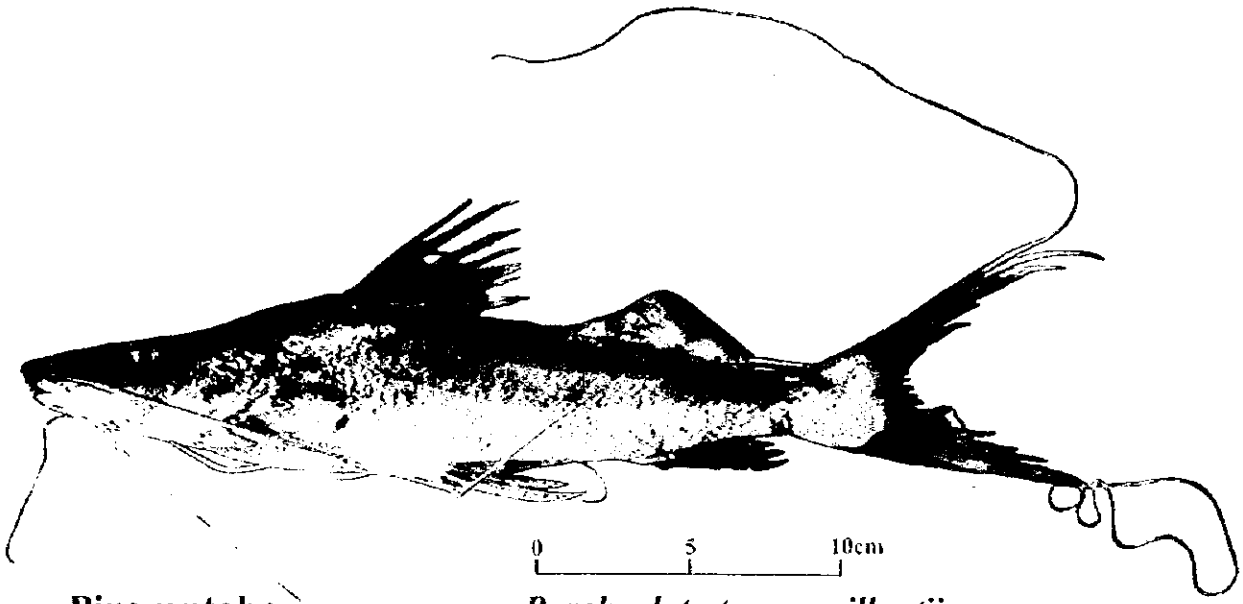
Plate 1. Continued



Filhote ***Brachyplatystoma filamentosum***

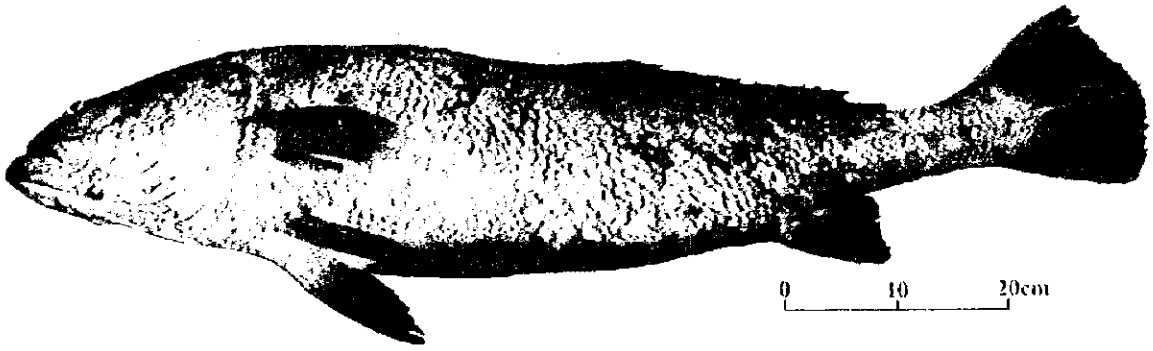


Dourada ***Brachyplatystoma flavicans***

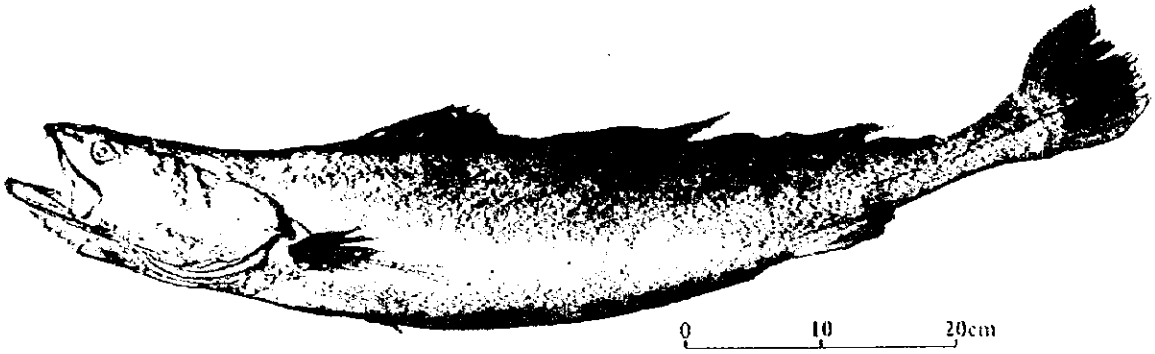


Piramutaba ***Brachyplatystoma vaillantii***

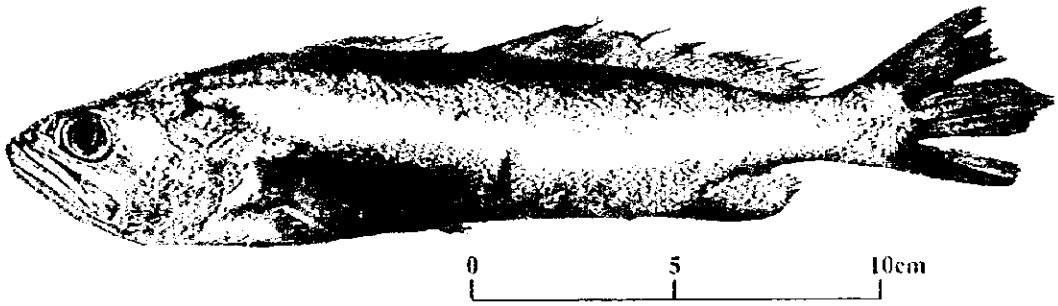
Plate 1. Continued



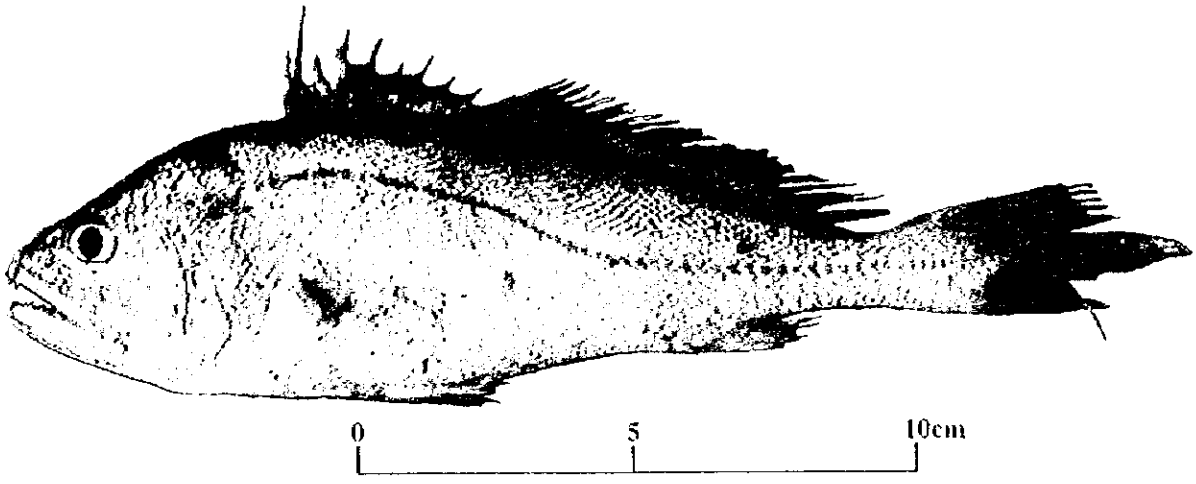
Pescada amarela *Cynoscion acoupa*



Corvina *Cynoscion virescens*



Pescadinha go *Macrodon ancylodon*



Pescada branca *Plagioscion squamosissimus*

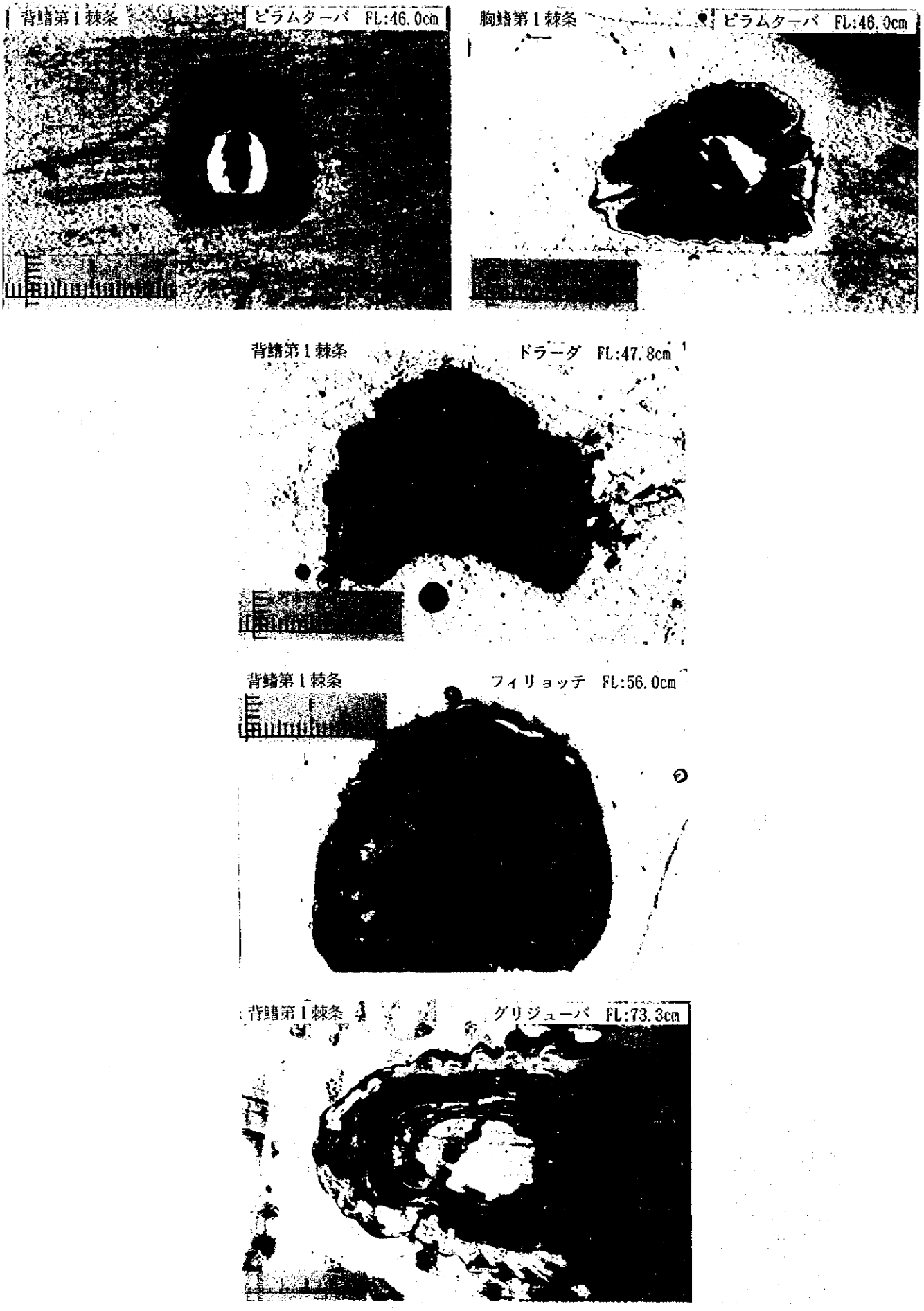
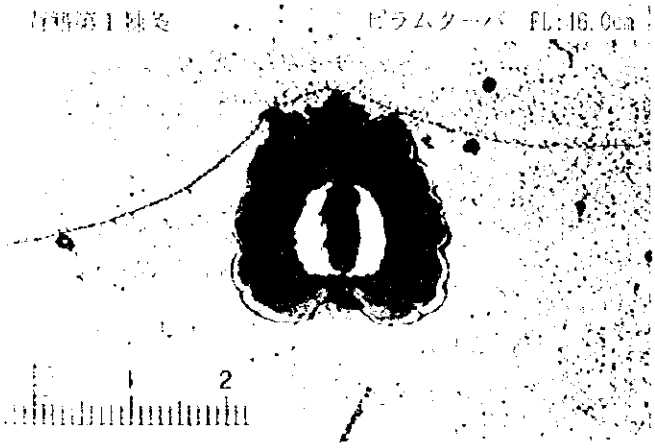
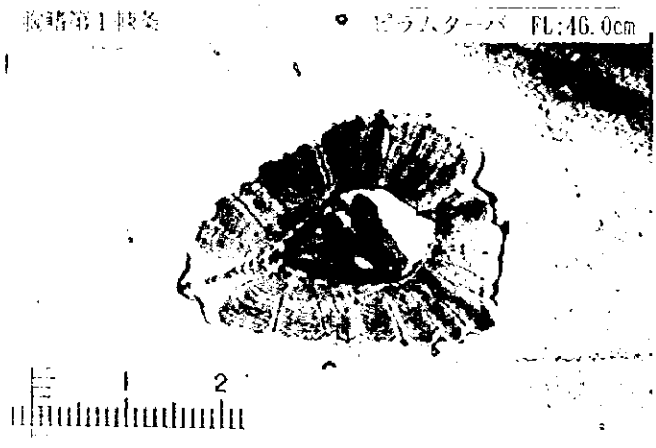


Plate 2. 重 要 魚 種 の 棘 条

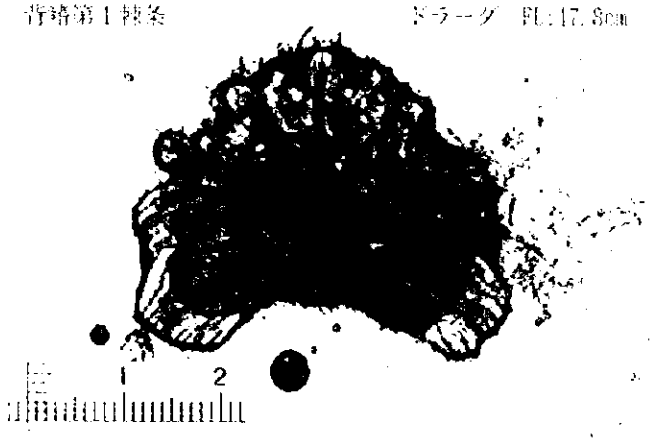
背鰭第1棘条　　ヒラムクーバ　FL:16.0cm



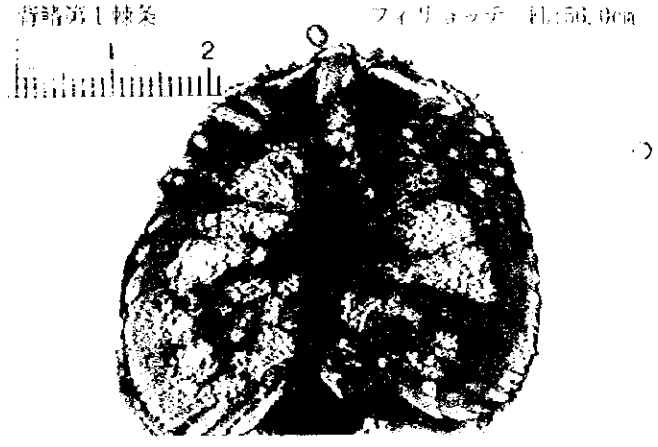
背鰭第1棘条　　ヒラスクーバ　FL:46.0cm



背鰭第1棘条　　ドラーグ　FL:17.8cm



背鰭第1棘条　　フィリョッテ　FL:56.0cm



背鰭第1棘条　　クロジョーバ　FL:73.3cm

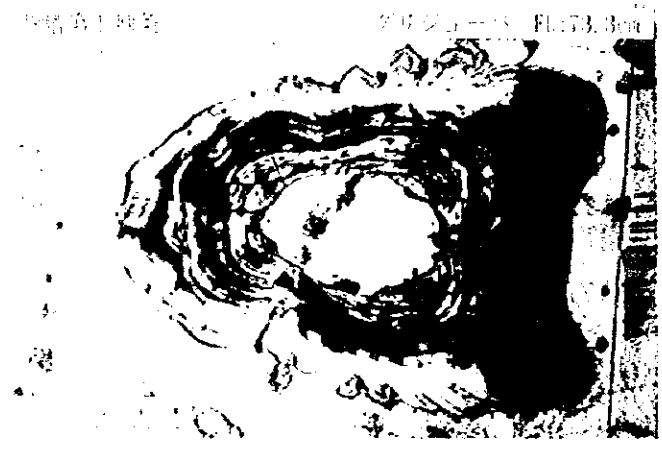
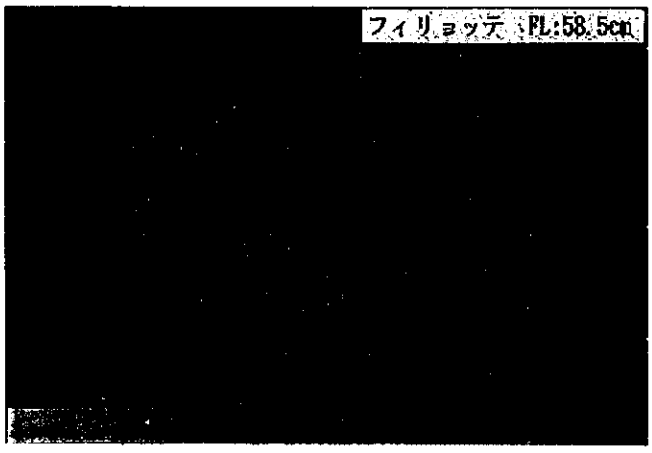
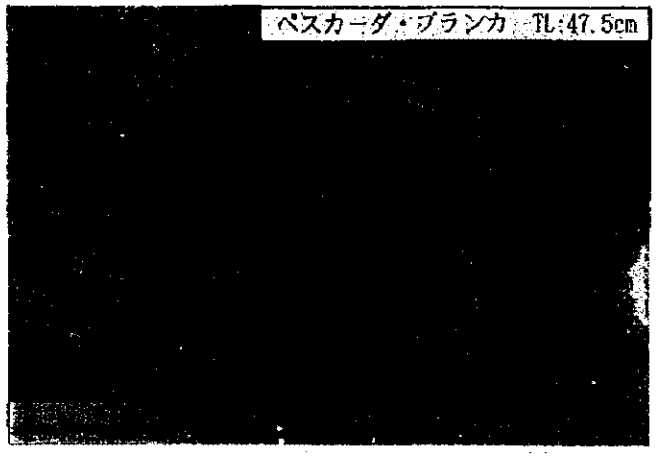
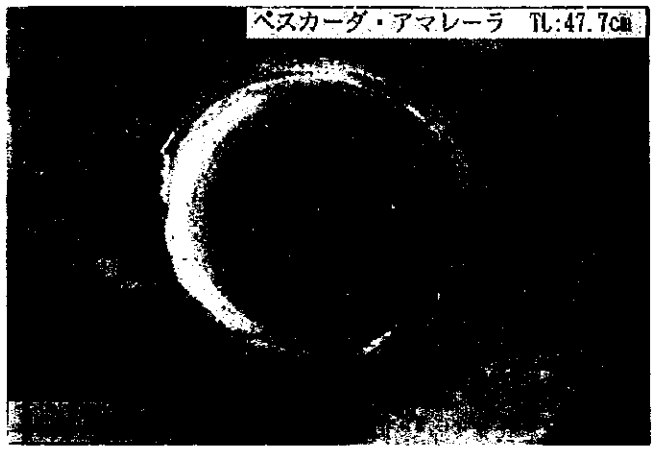
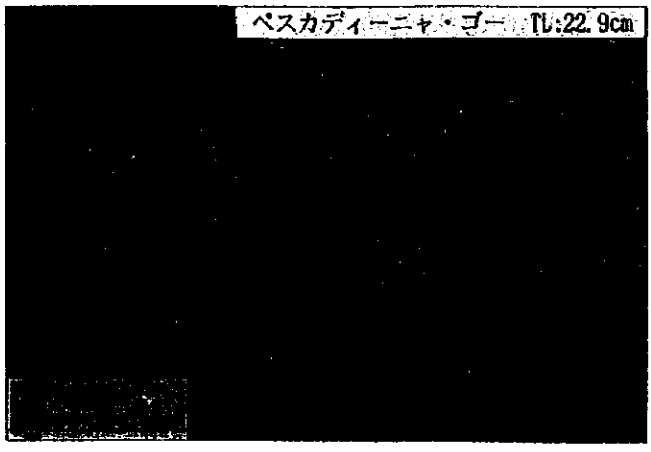


Plate 2.　重要魚種の棘条









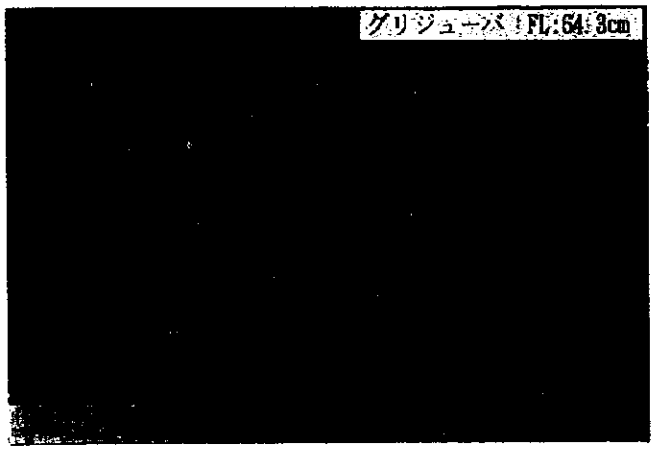
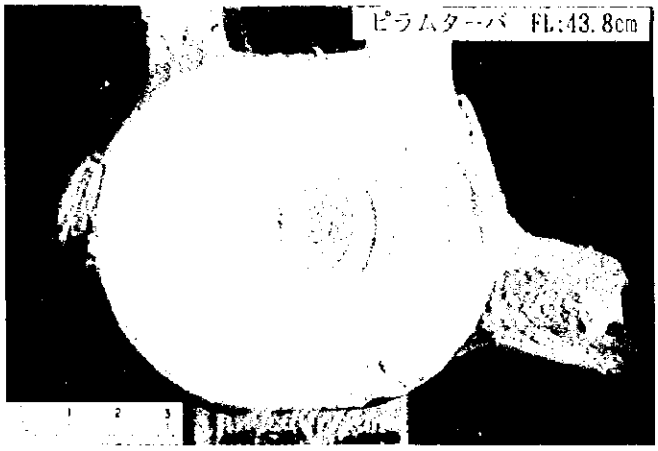
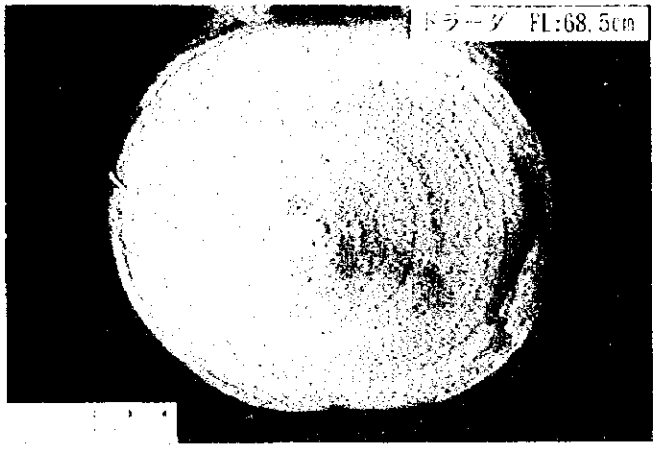
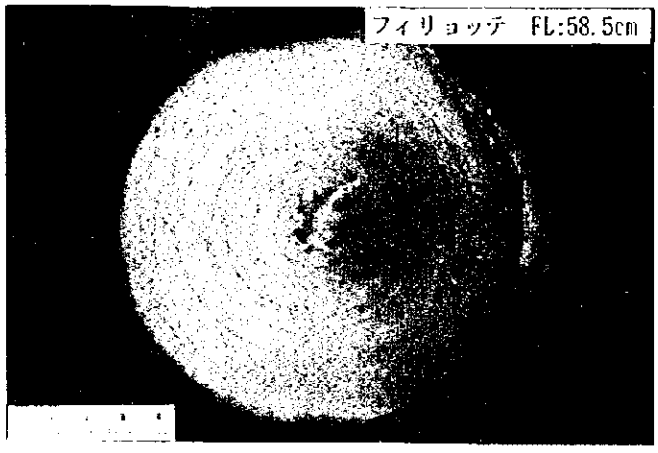
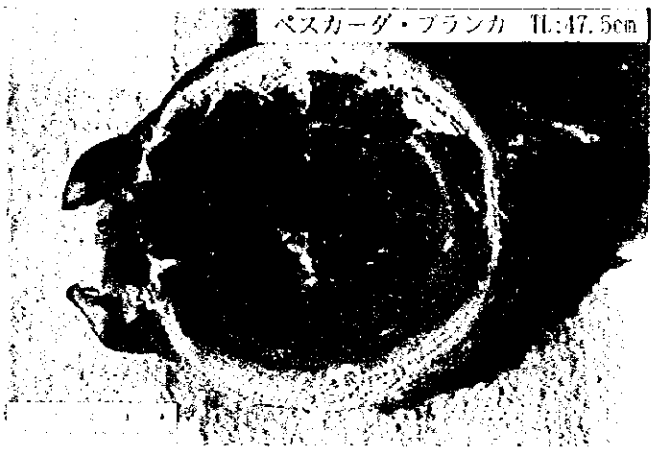


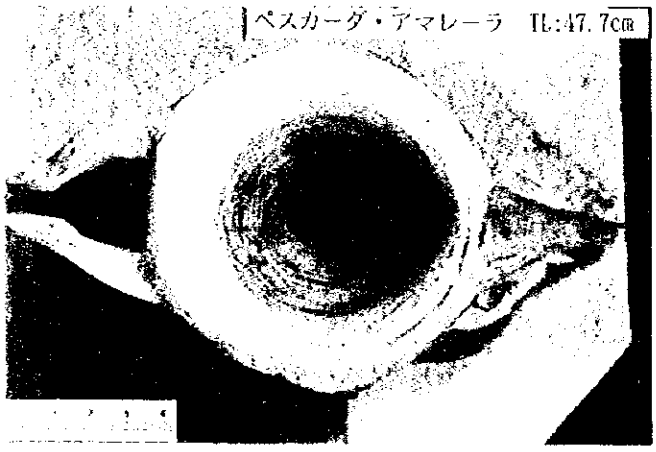
Plate 3. 重 要 魚 種 の 推 体











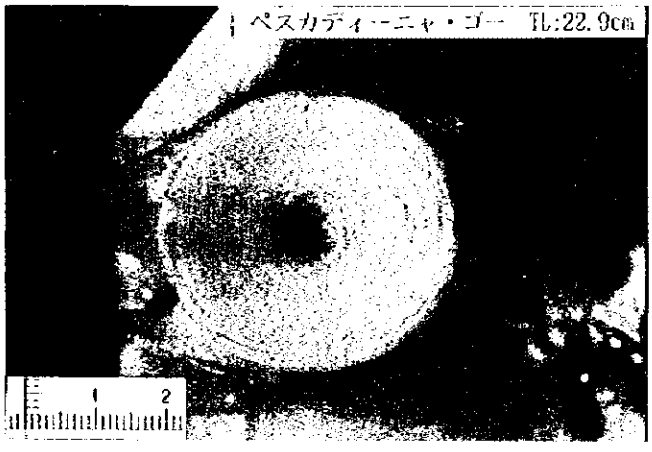
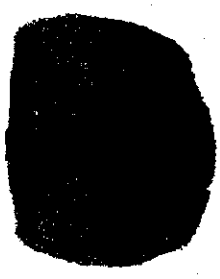
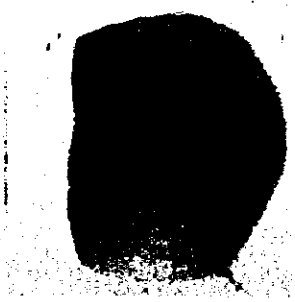


Plate 3. 重要魚種の椎体

ペスカーダ・ブランカ
TL:47.5cm
採取部位 B

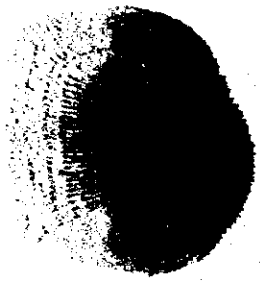


ペスカーダ・ブランカ
TL:47.5cm
採取部位 D



ペスカーダ・アマレーラ
TL:47.7cm
採取部位 A

ペスカーダ・アマレーラ
TL:47.7cm
採取部位 C

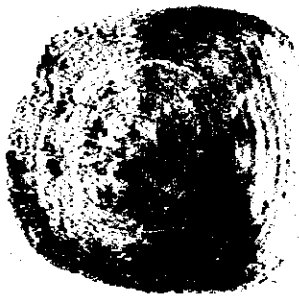


ペスカーダ・アマレーラ
TL:47.7cm
採取部位 B

ペスカディーニャ・ゴー
TL:31.0cm
採取部位 A

ペスカディーニャ・ゴー
TL:29.0cm
採取部位 E

ペスカディーニャ・ゴー
TL:28.4cm
採取部位 B



ペスカディーニャ・ゴー
TL:29.0cm
採取部位 F

Plate 4.　重 要 魚 種 の 鱗

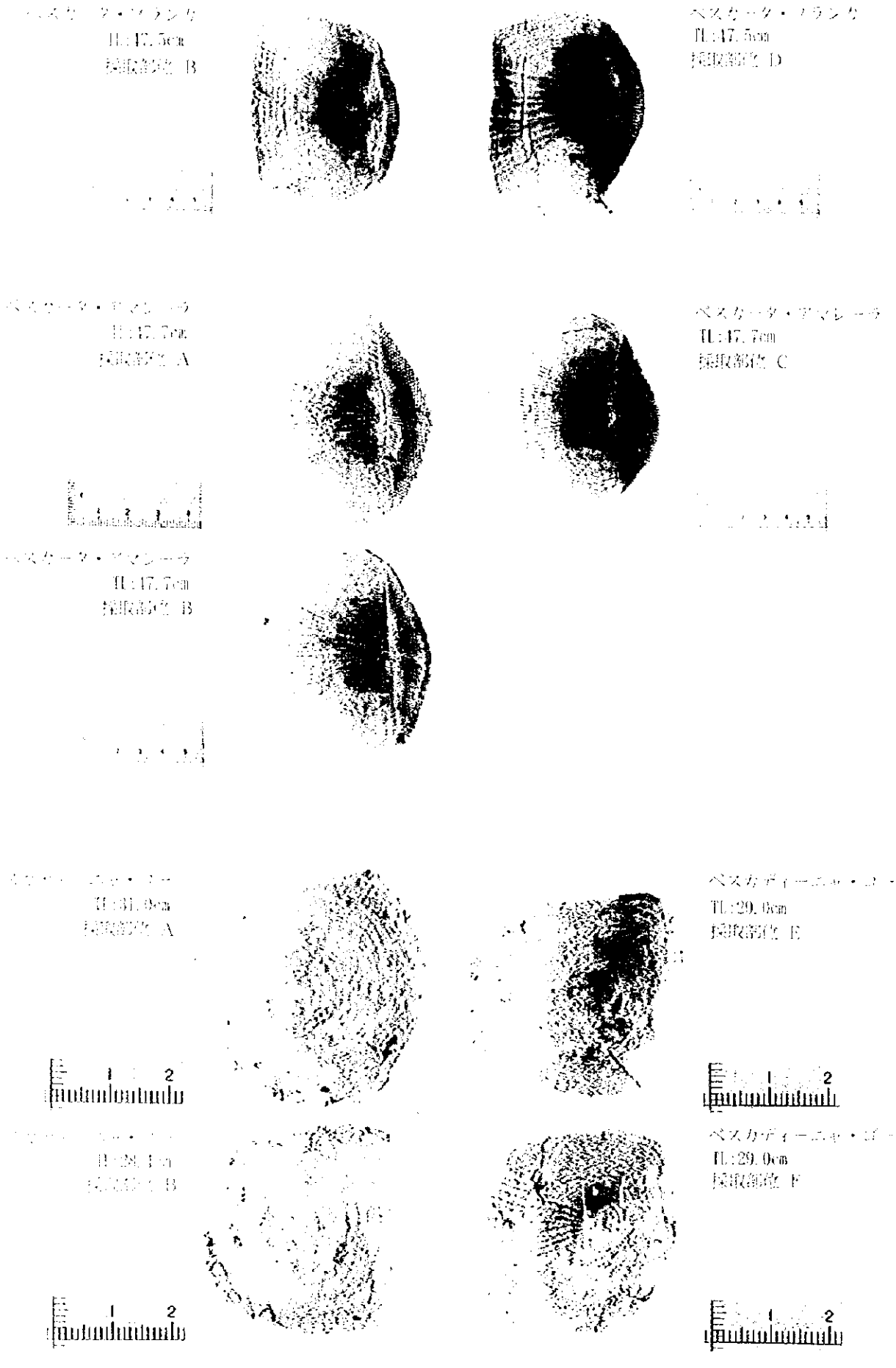
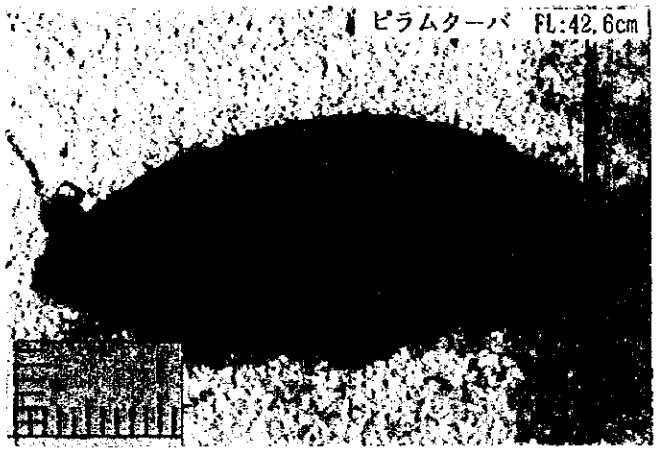
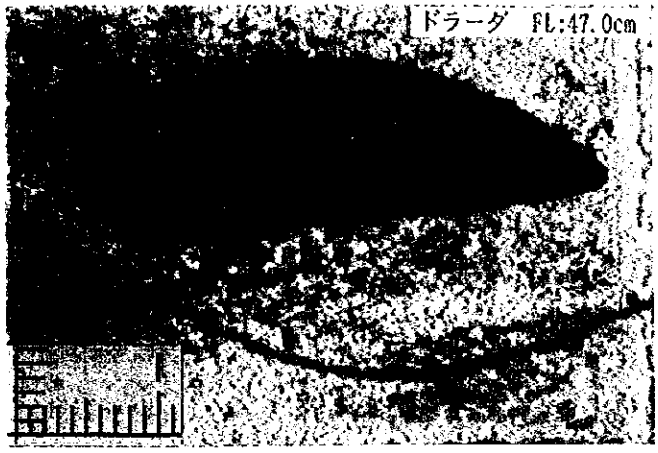
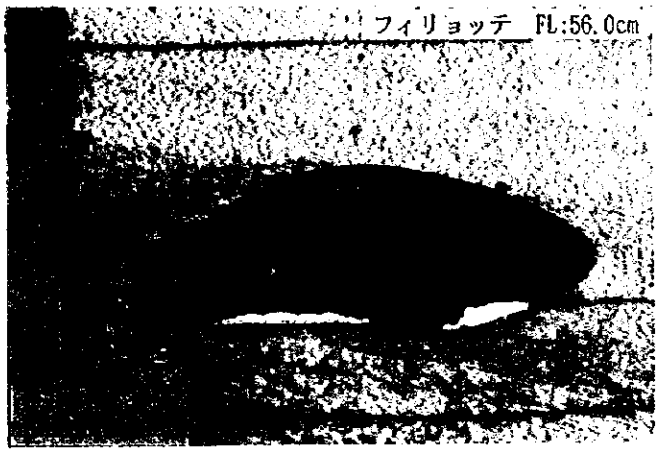
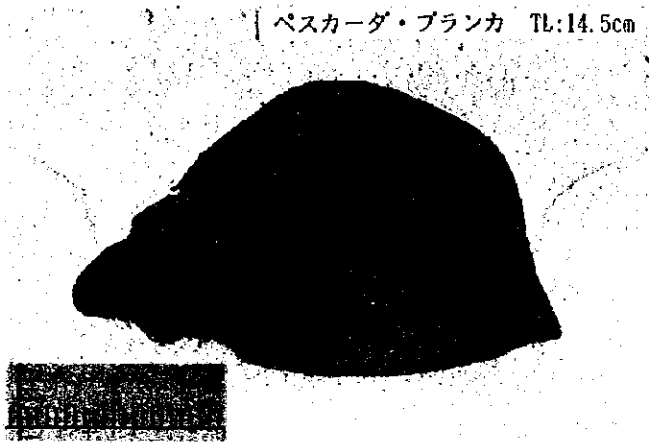


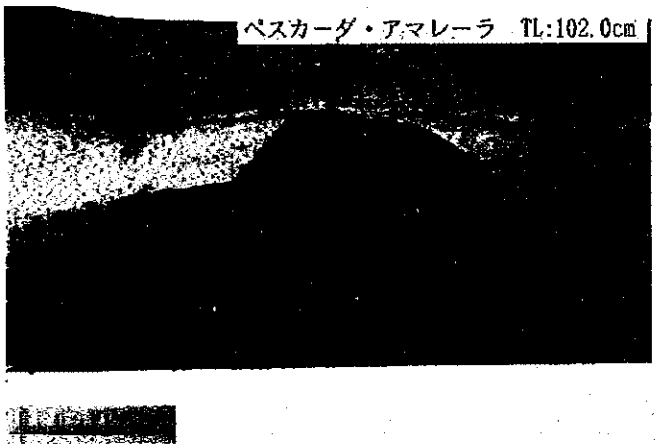
Plate 4. 重要魚種の鱗

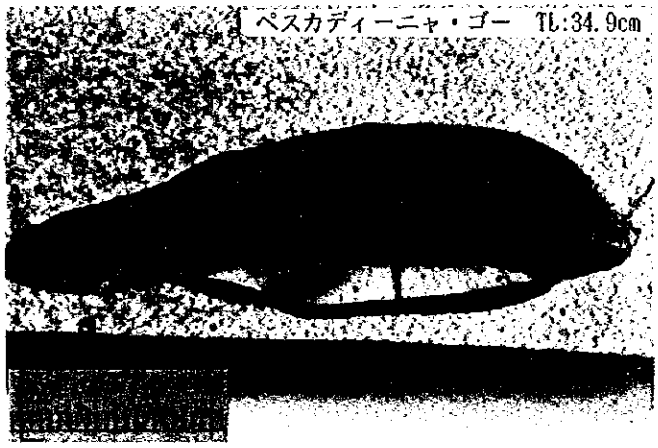












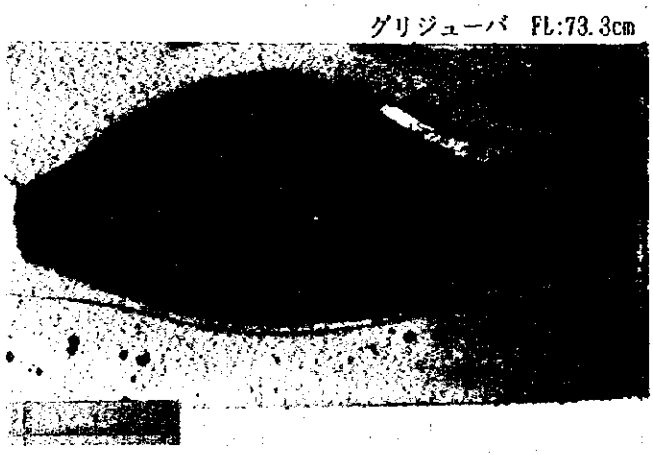
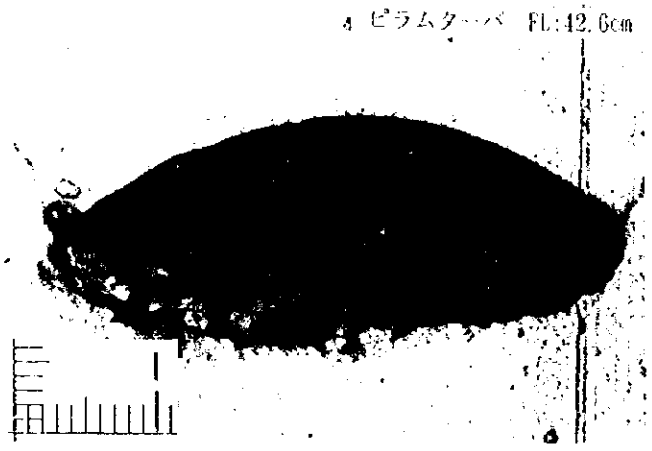
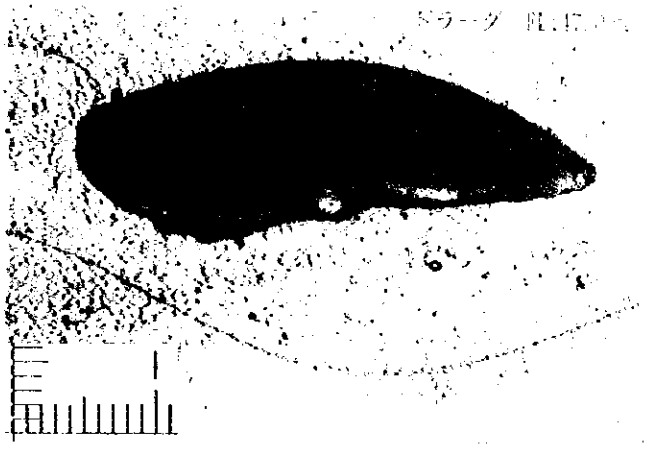
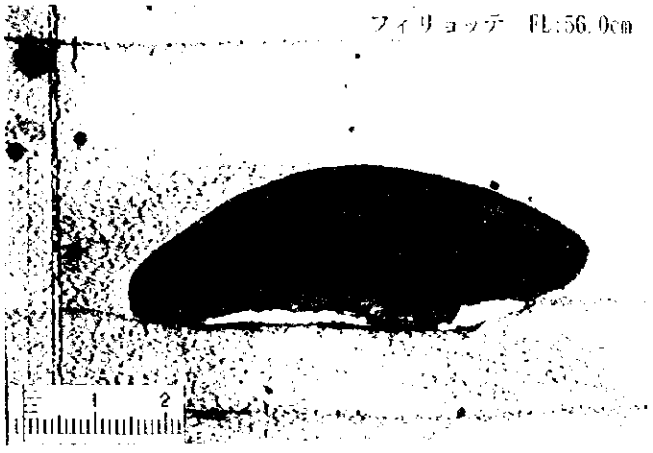
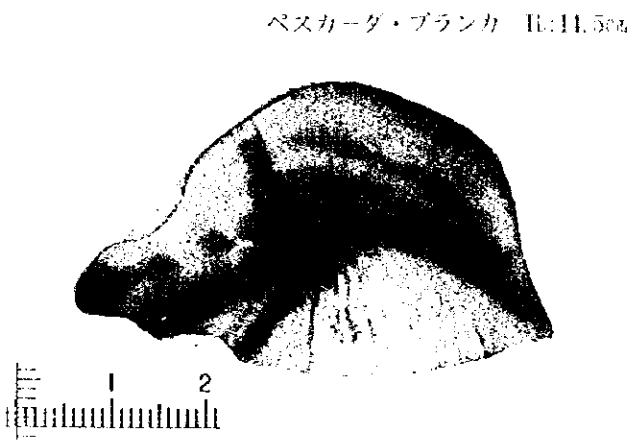


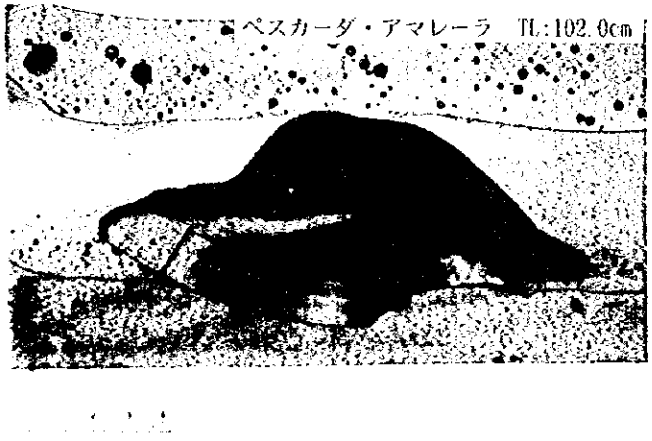
Plate 5. 重要魚種の耳石











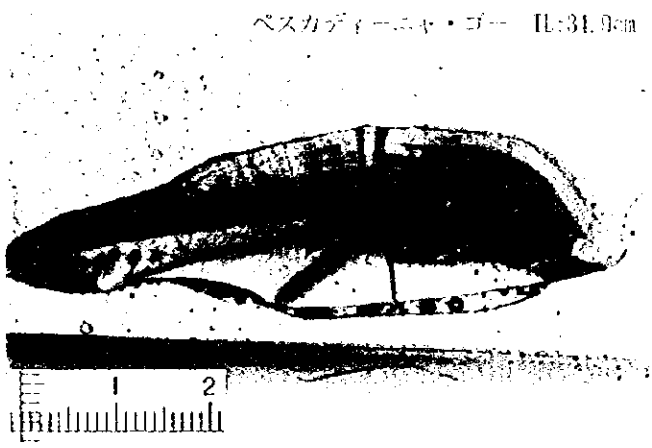


Plate 5. 重要魚種の耳石

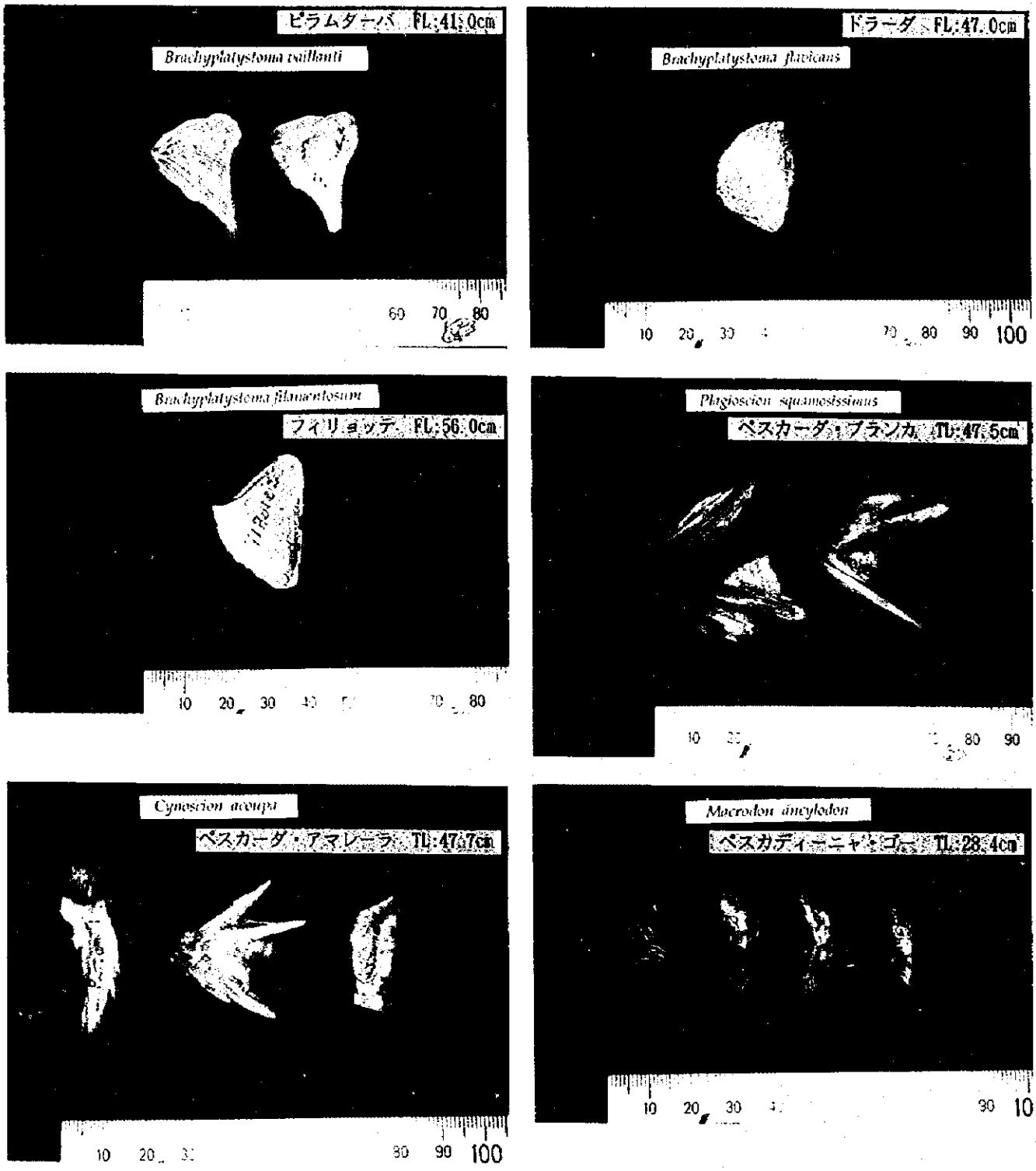


Plate 6. 重要魚種の鰓蓋骨

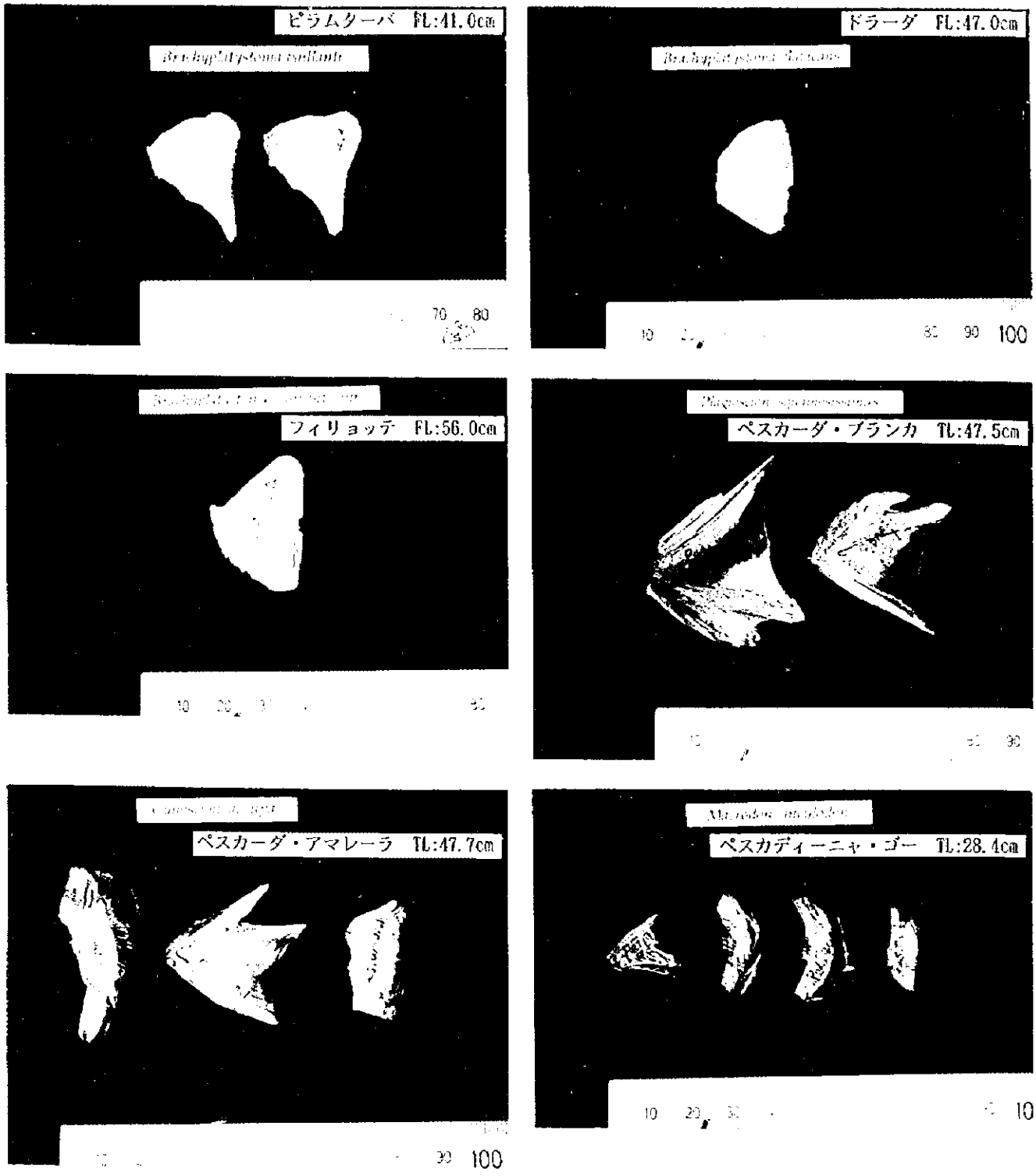
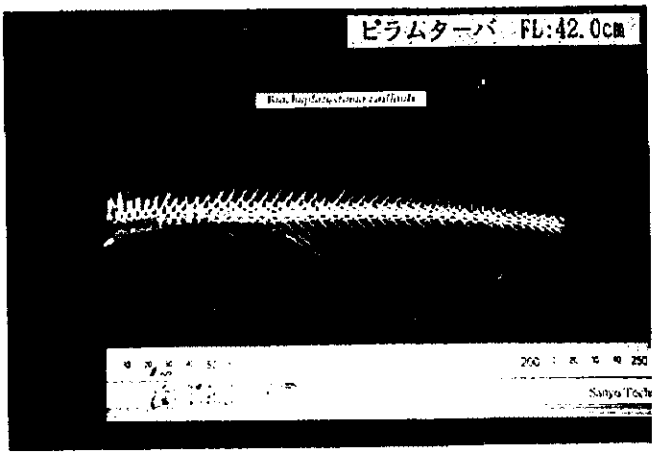
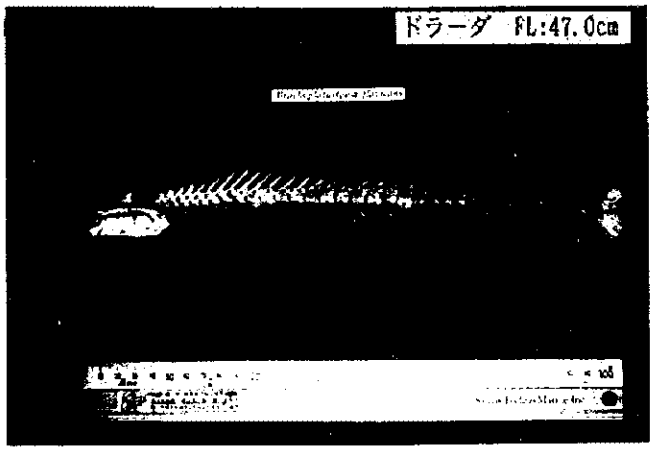
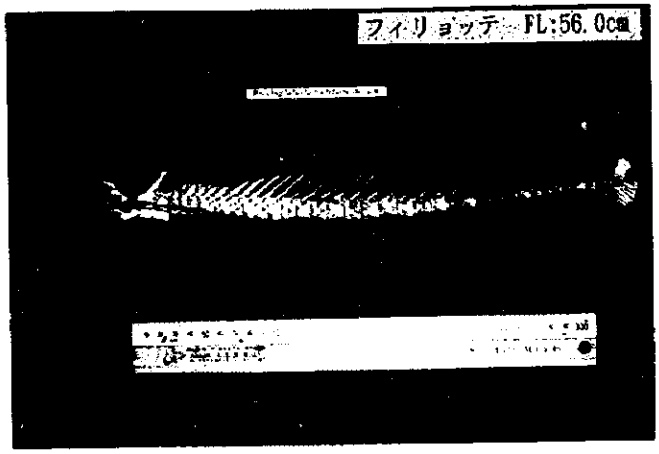
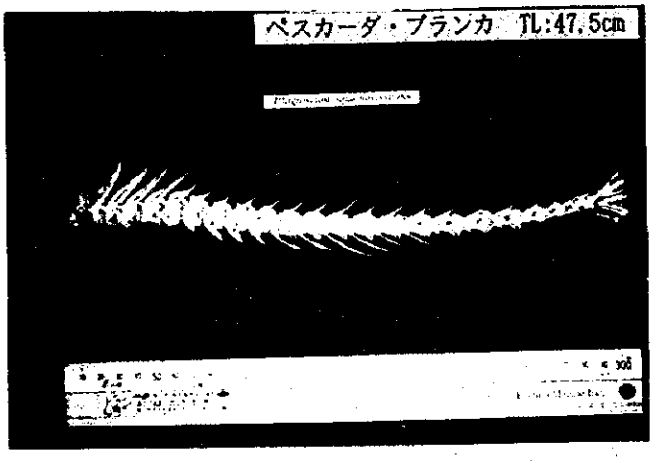


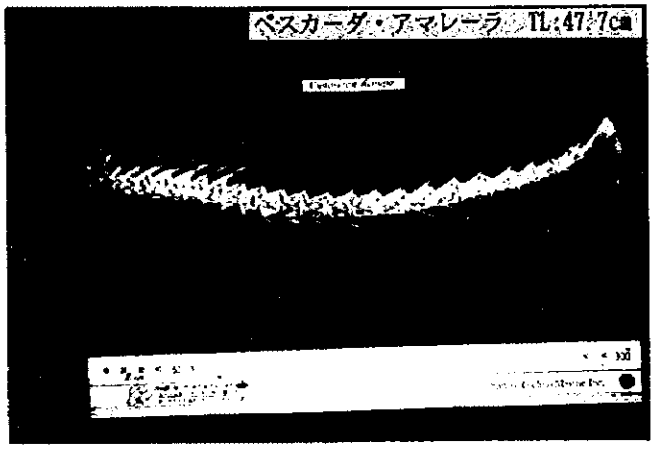
Plate 6. 重要魚種の鰓蓋骨

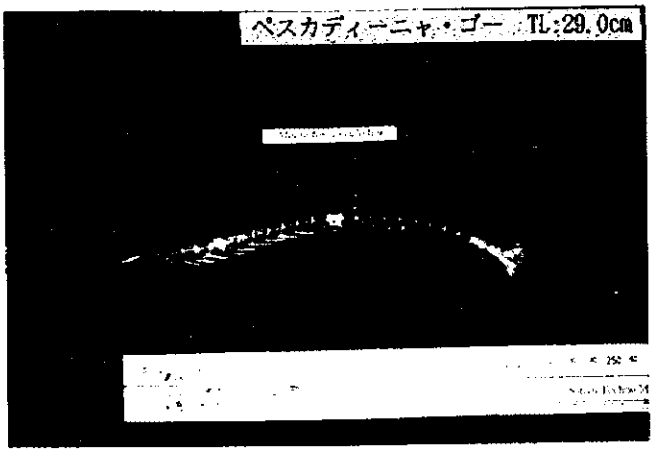












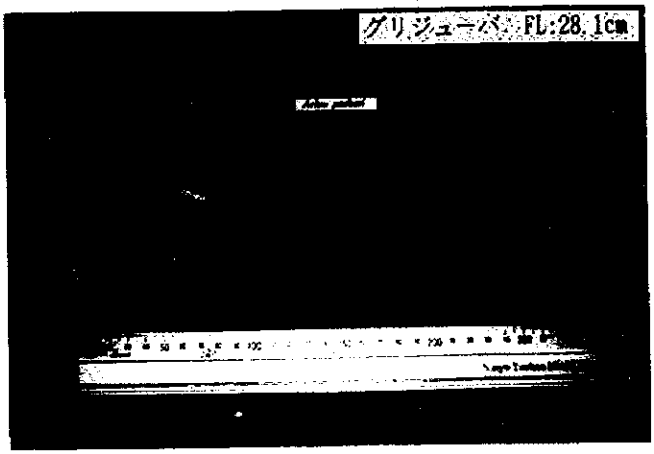
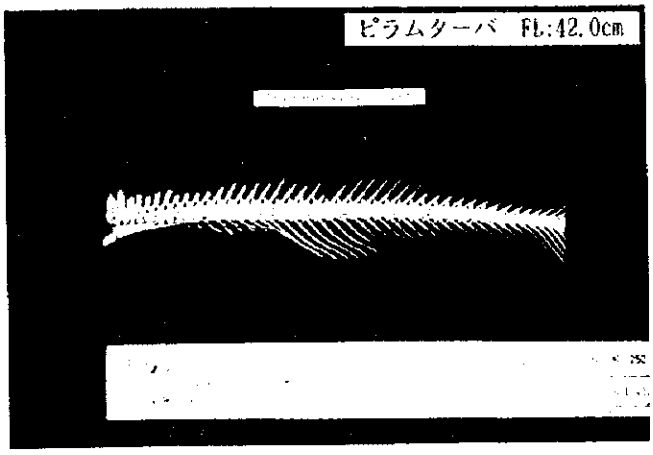
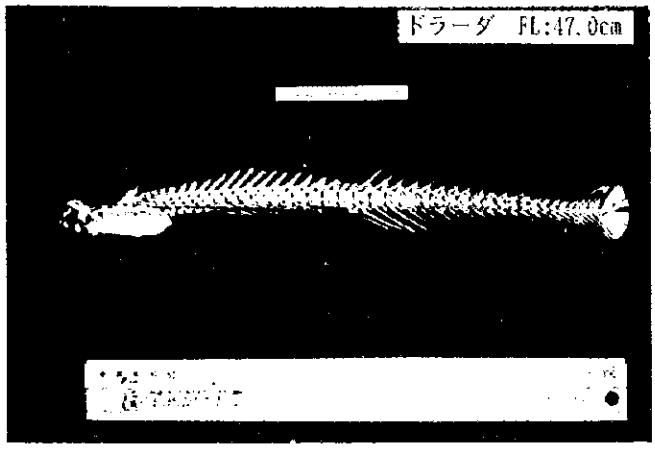
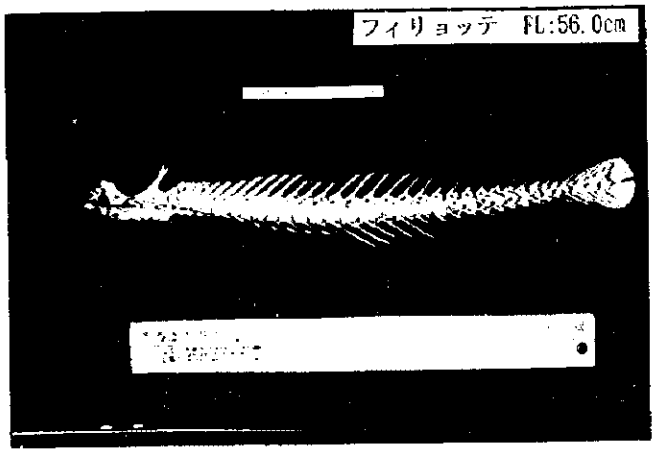
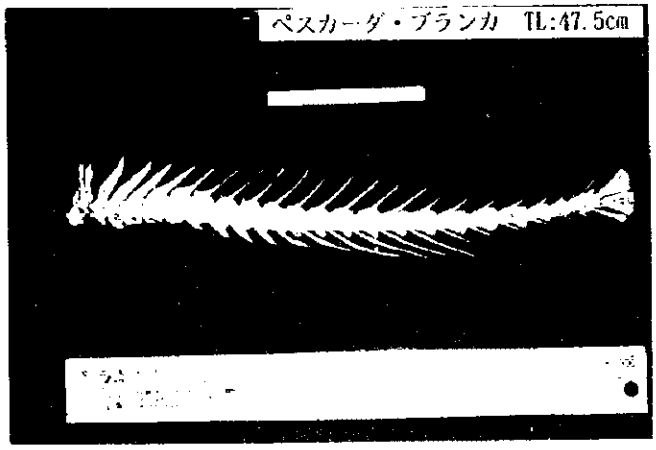


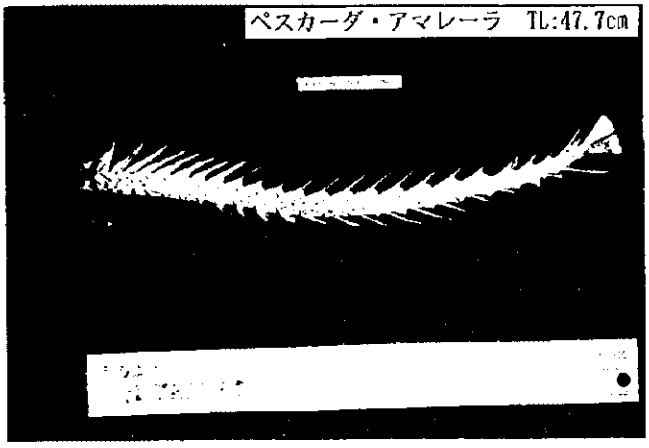
Plate 7. 重要魚種の骨格標本

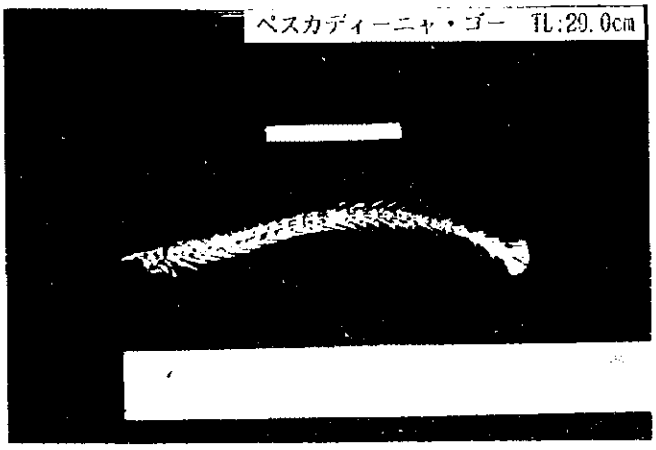












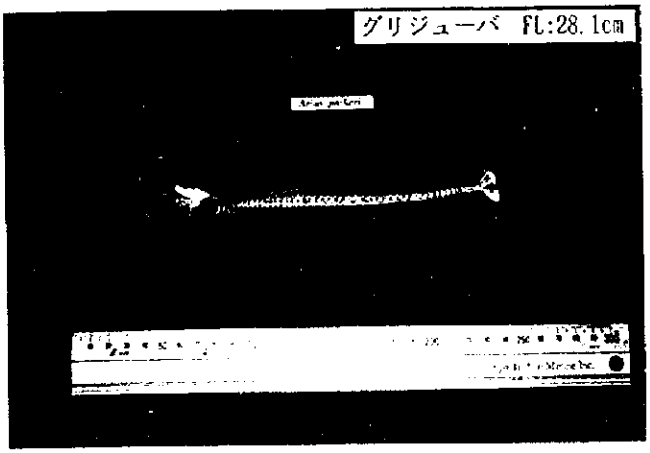


Plate 7. 重要魚種の骨格標本