

Oyster Aquaculture in Korea

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Korean coastal area includes,

- 1) West Coast : Yellow Sea
- 2) South Coast : Many bays and islands
- 3) East Coast : East Sea (Sea of Japan)

West Coast: Water temperature varies 4 to 26 °C annually, high tidal range and well developed tidal flats, estuarine environment, high productivity. Clams and prawn culture is common.

South Coast: numbers of semi-enclosed bays and islands, moderate tidal range and tidal flats, several estuaries, lots of oysters, mussels, ark shells and sea squirt farms.

East Coast: open oceanic marine environment, water temperature varies 4 to 24 °C annually, no major estuaries, rocky shores, scallop culture industry developed.



Korean Aquaculture Production in 2004

Other

Invertebrate

8,939 ton

Fish 84,610 ton

**Crustacean
2,504 ton**

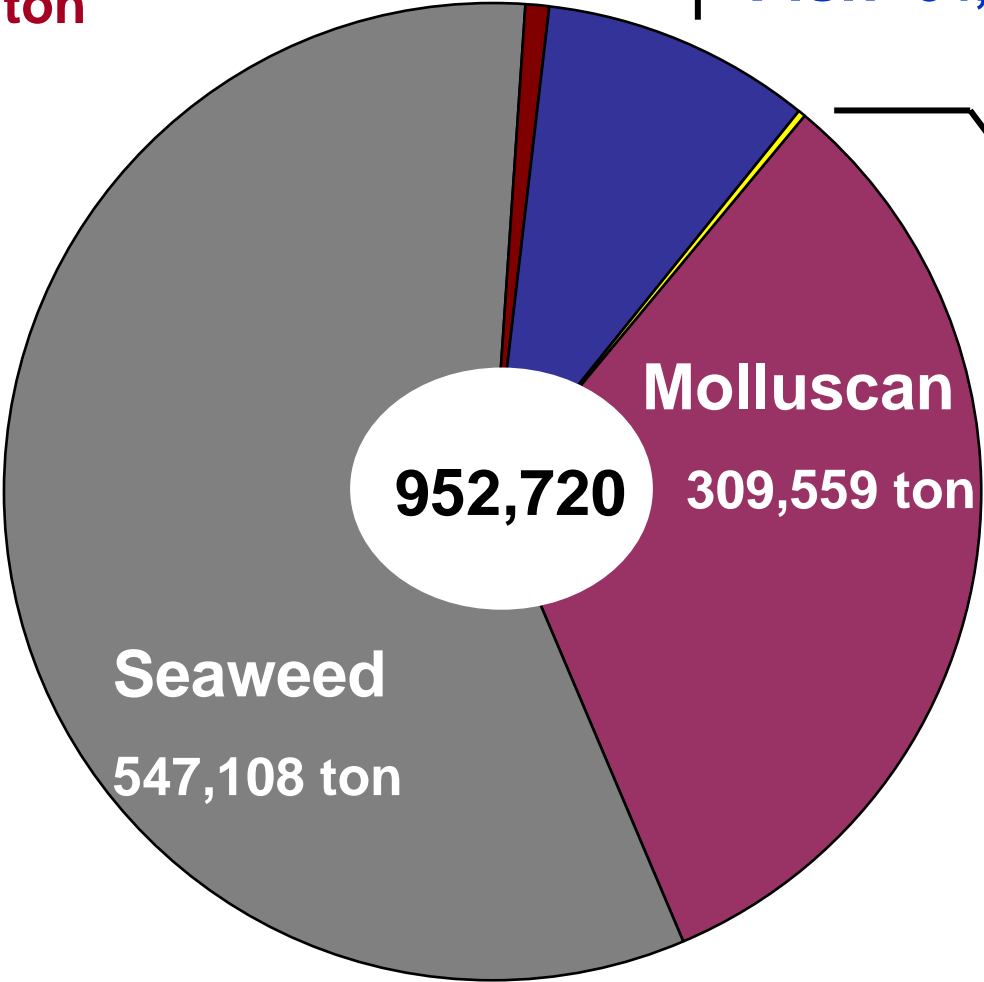
Molluscan

309,559 ton

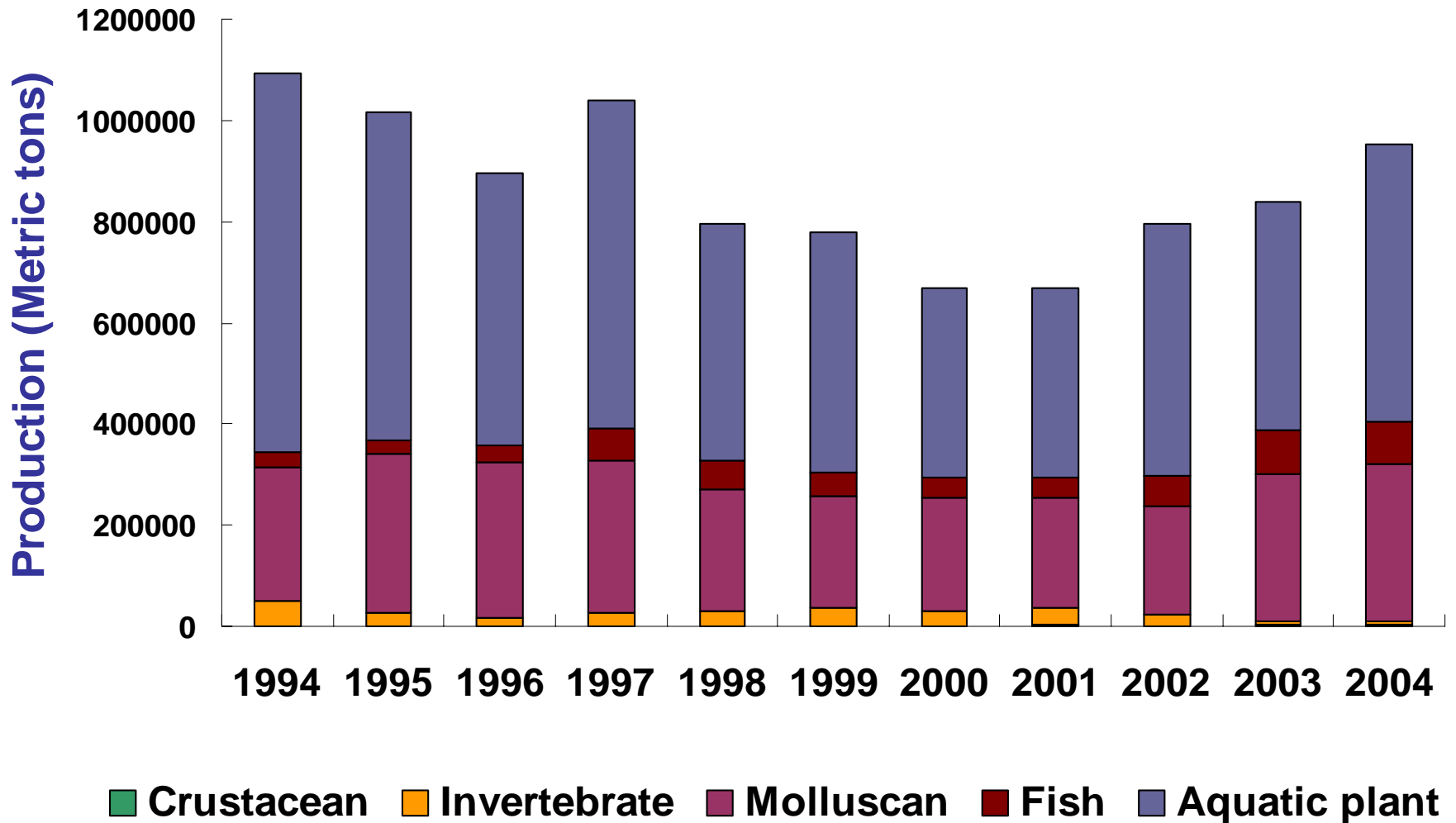
952,720

Seaweed

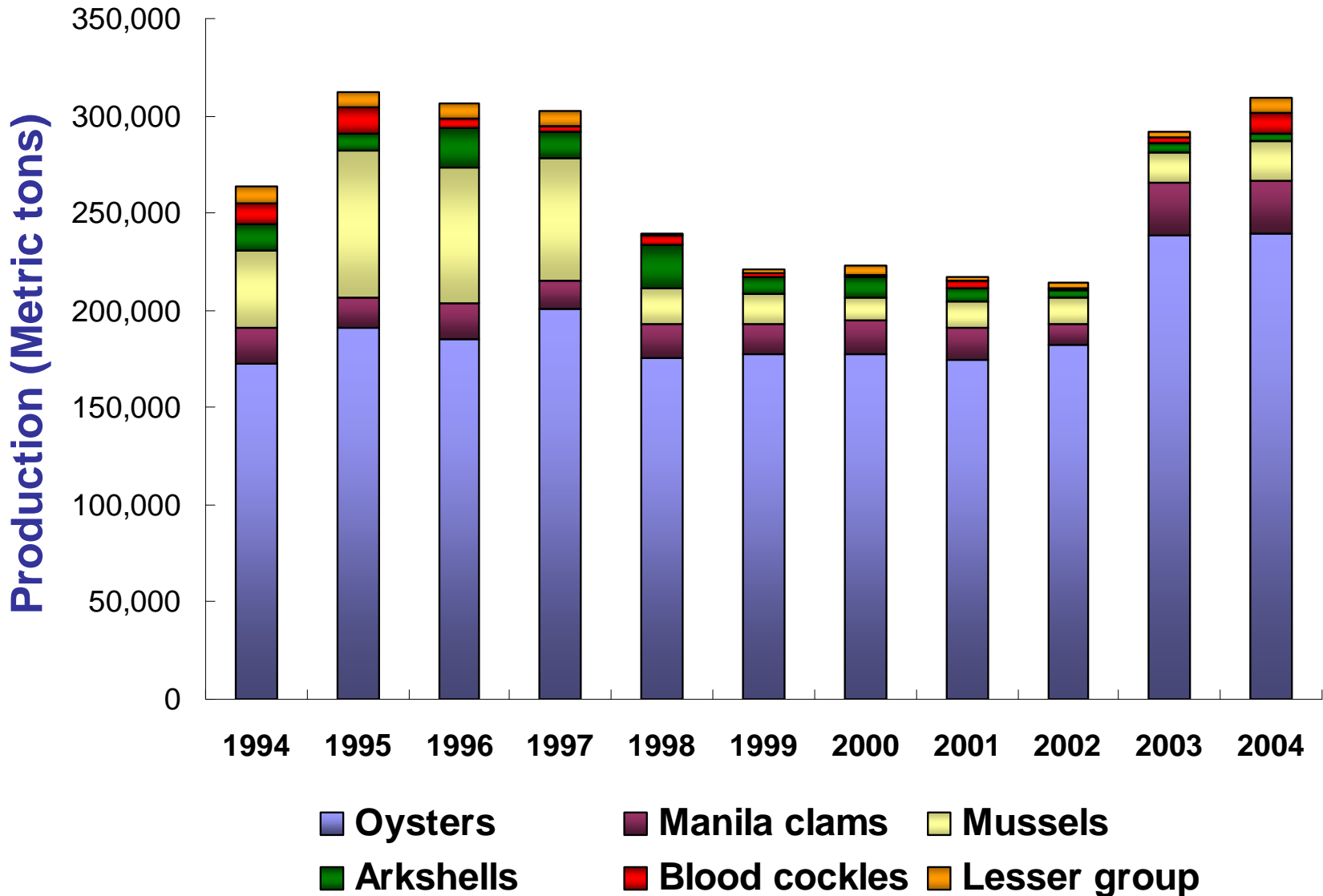
547,108 ton



ANNUAL AQUACULTURE PRODUCTION IN KOREA



ANNUAL SHELLFISH PRODUCTION IN KOREA



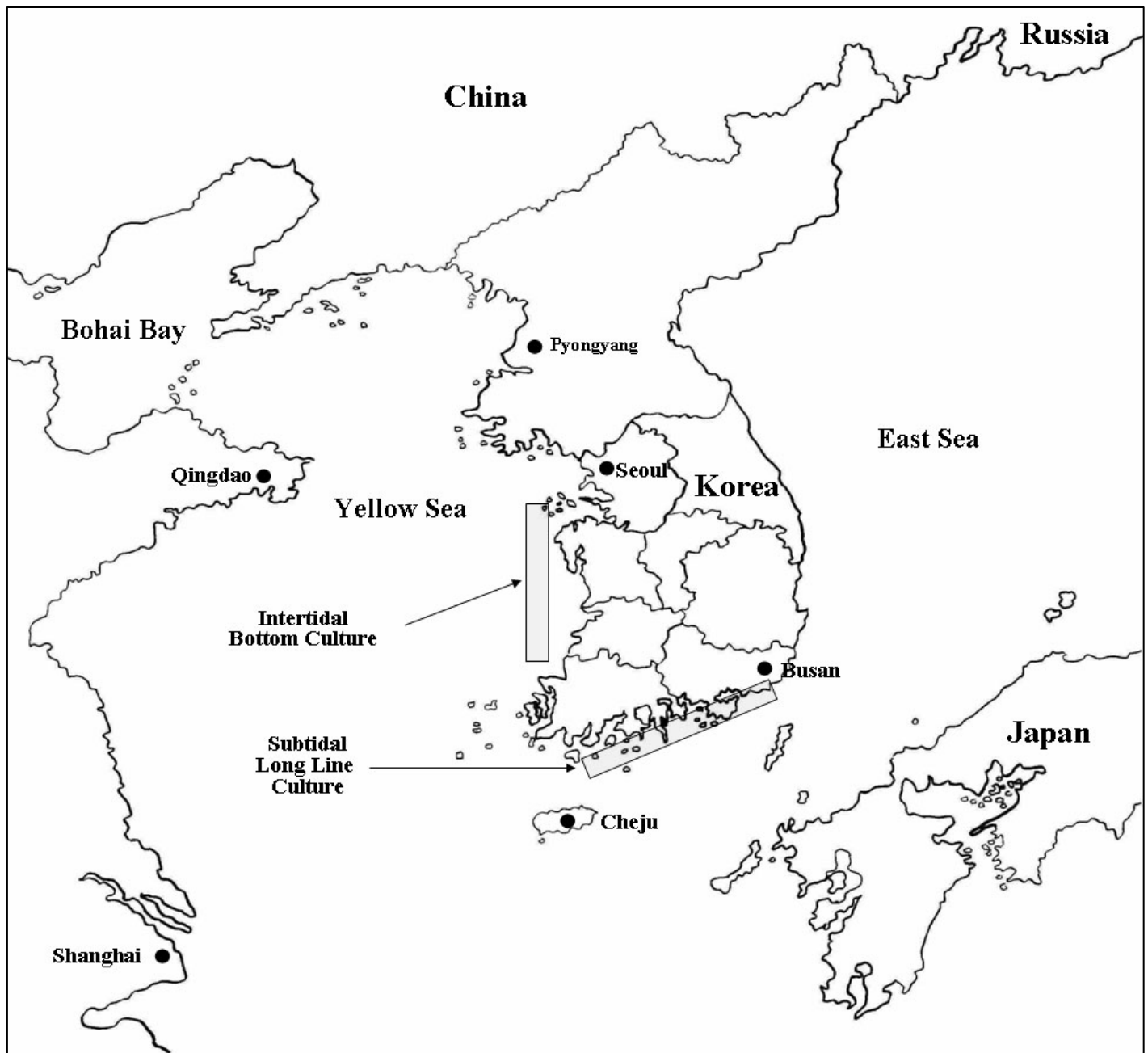


Fig 1. Map showing oyster farming areas in Korea

Family	Species	Common name	Distribution	Remarks
Ostreidae	<i>Ostrea denselamellosa</i> Lischke 1869	Flat oyster	West and South Coast	Used in bottom culture on the south coast
	<i>Ostrea circumpicta</i> Pilsbry 1904		Jeju Island	
	<i>Dendostrea folia</i> Linnaeus 1758		Jeju Island	
	<i>Dendostrea crenulifera</i> Sowerby 1878			
	<i>Crassostrea gigas</i> Thunberg 1793	Pacific oyster, Pacific cupped oyster	West, South and East coast	Mainly cultured in the small bays off the south coast using hanging long-line system and bottom culture on the west
	<i>Crassostrea pestigris</i> Hanley 1846		South Coast	
	<i>Crassostrea nipponica</i> Seki 1934		East Coast	
	<i>Crassostrea ariakensis</i> Fujita and Wakiya 1929		West and South coast	Cultured in river-mouth area
	<i>Crassostrea nigromarginata</i> Sowerby 1871		Jeju Island	
	<i>Saccostrea kegaki</i> Torigoe and Inobe 1981		Jeju Island	
Gryphaeidae	<i>Neopycnodonta cochlear</i> Poli 1795		? depth 50-300 m	
	<i>Hyotissa hyotis</i> Linnaeus 1758		Jeju Island	
	<i>Parahyotissa inermis</i> Sowerby II 1871		Jeju Island	
	<i>Parahyotissa chemnitzii</i> Hanley 1846		Jeju Island	



Fig 2. *Crassostrea gigas*

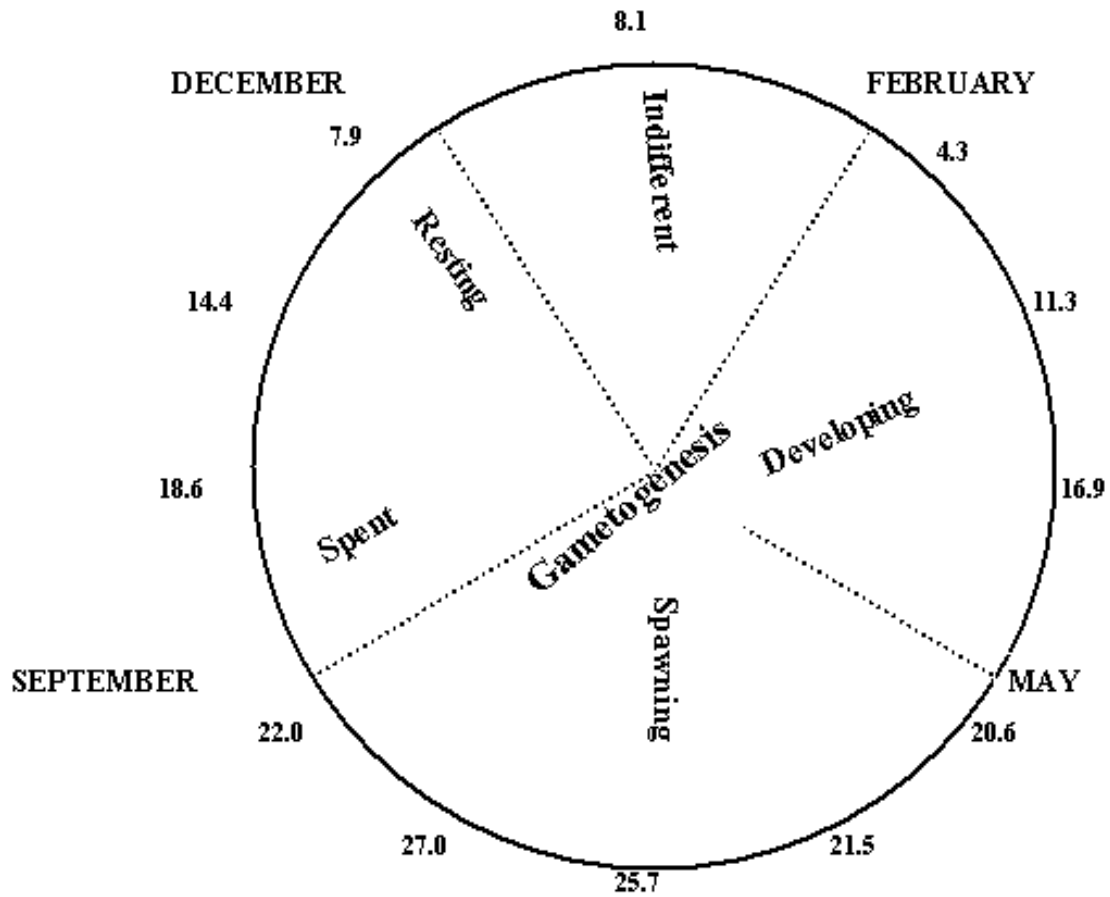


Fig 3. Cyclic change in gametogenesis of oysters in Gosung Bay. The numbers represent monthly mean value water temperature (°C, Ngo et al., 2002).

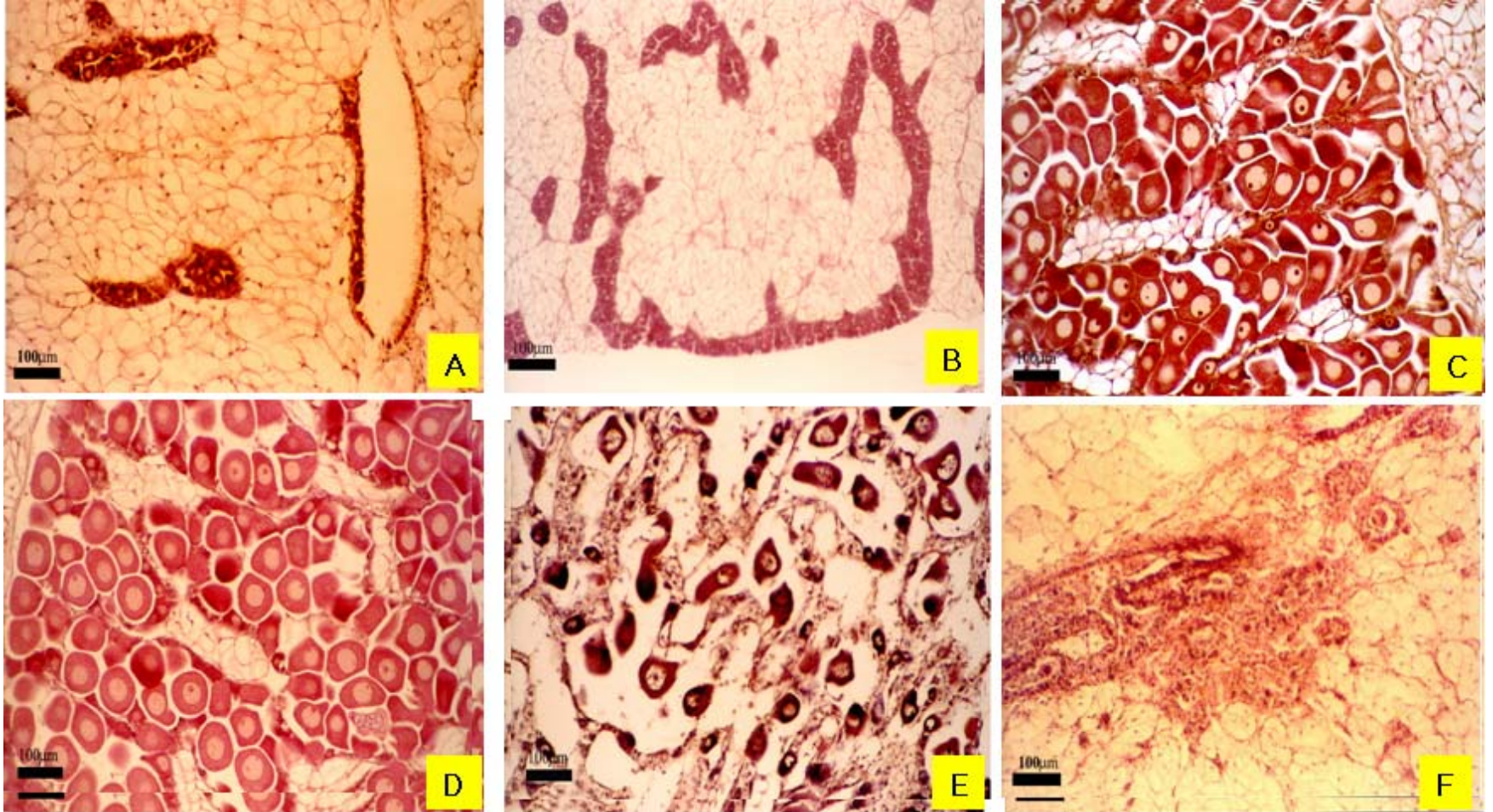


Fig 4. Gonadal development in female oysters observed from Gosung bay, on the south coast. (A) Sexually undifferentiated stage, (B) Early development stage, (C) Late development stage, (D) Ripe stage, (E) Spawned stage, (F) Gonadal tissue atrophy (Ngo et al., 2002)

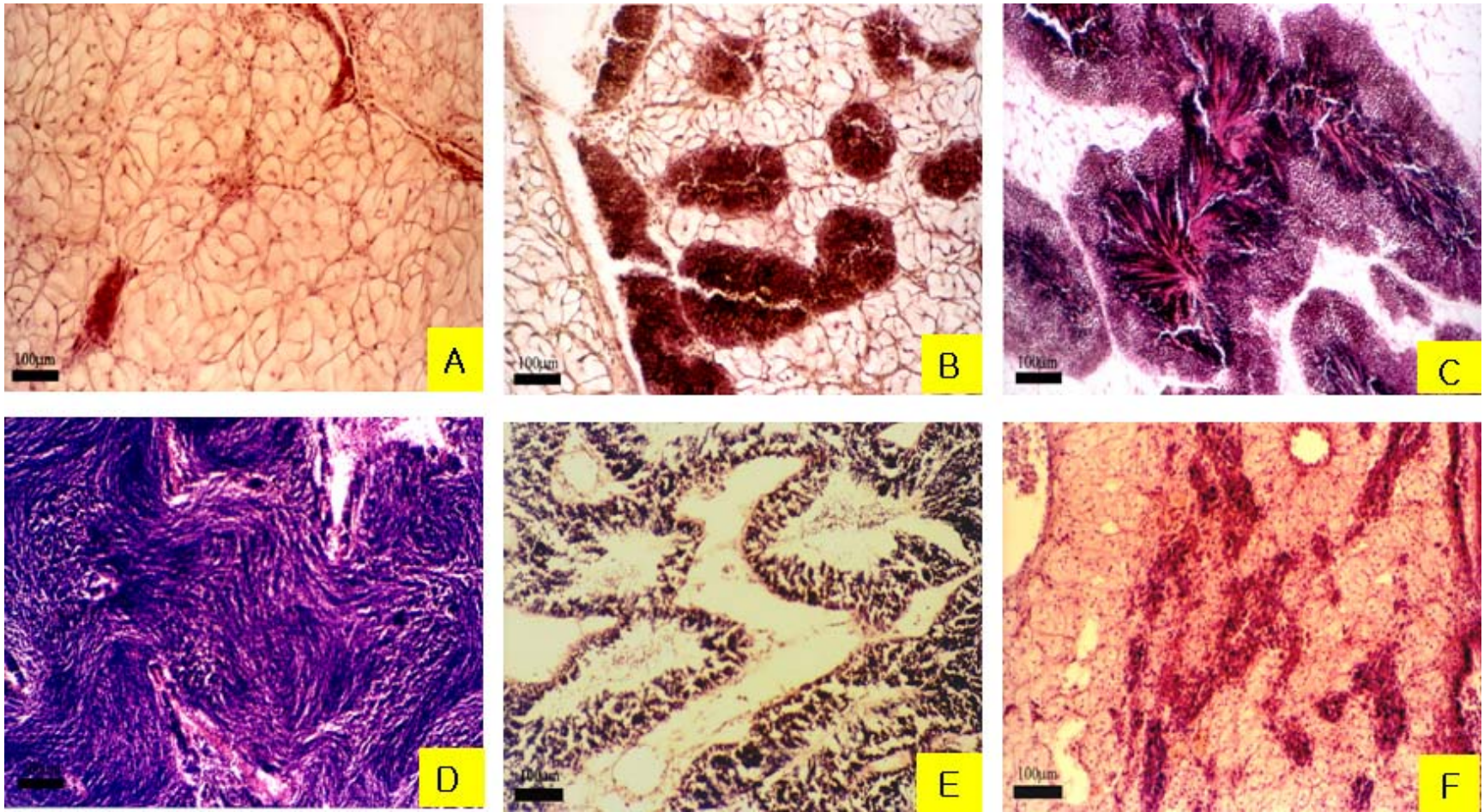


Fig 5. Gonadal development in male oysters observed from Gosung bay, on the south coast . (A) Sexually undifferentiated stage, (B) Early development stage, (C) Late development stage, (D) Ripe stage, (E) Spawned stage, (F) Gonadal tissue atrophy.

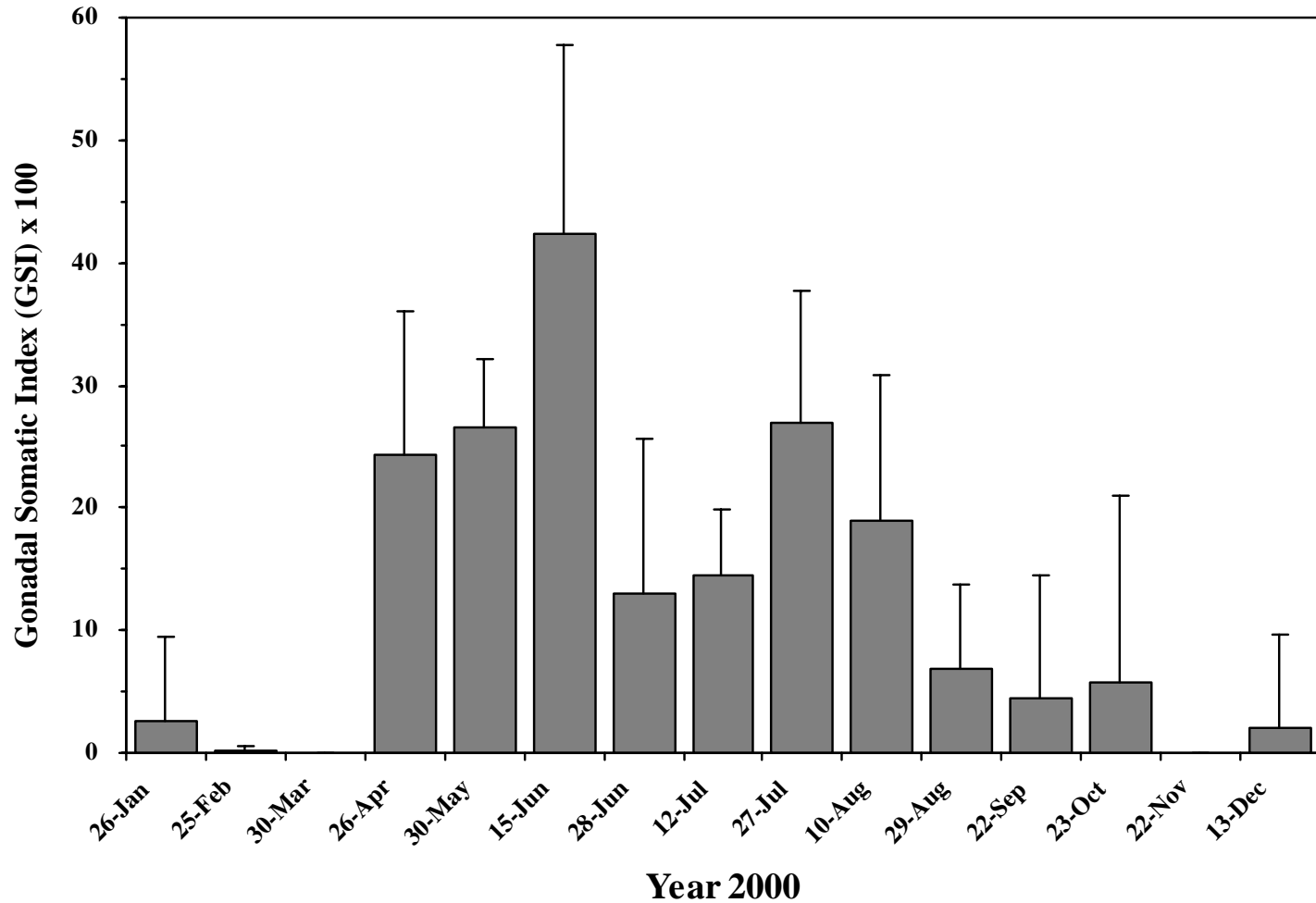


Fig 6. Seasonal variation in gonadal somatic index of the oysters raised in Goseong Bay. Each bar represents the monthly mean GSI with the standard deviation as a vertical line (Kang et al., 2003).

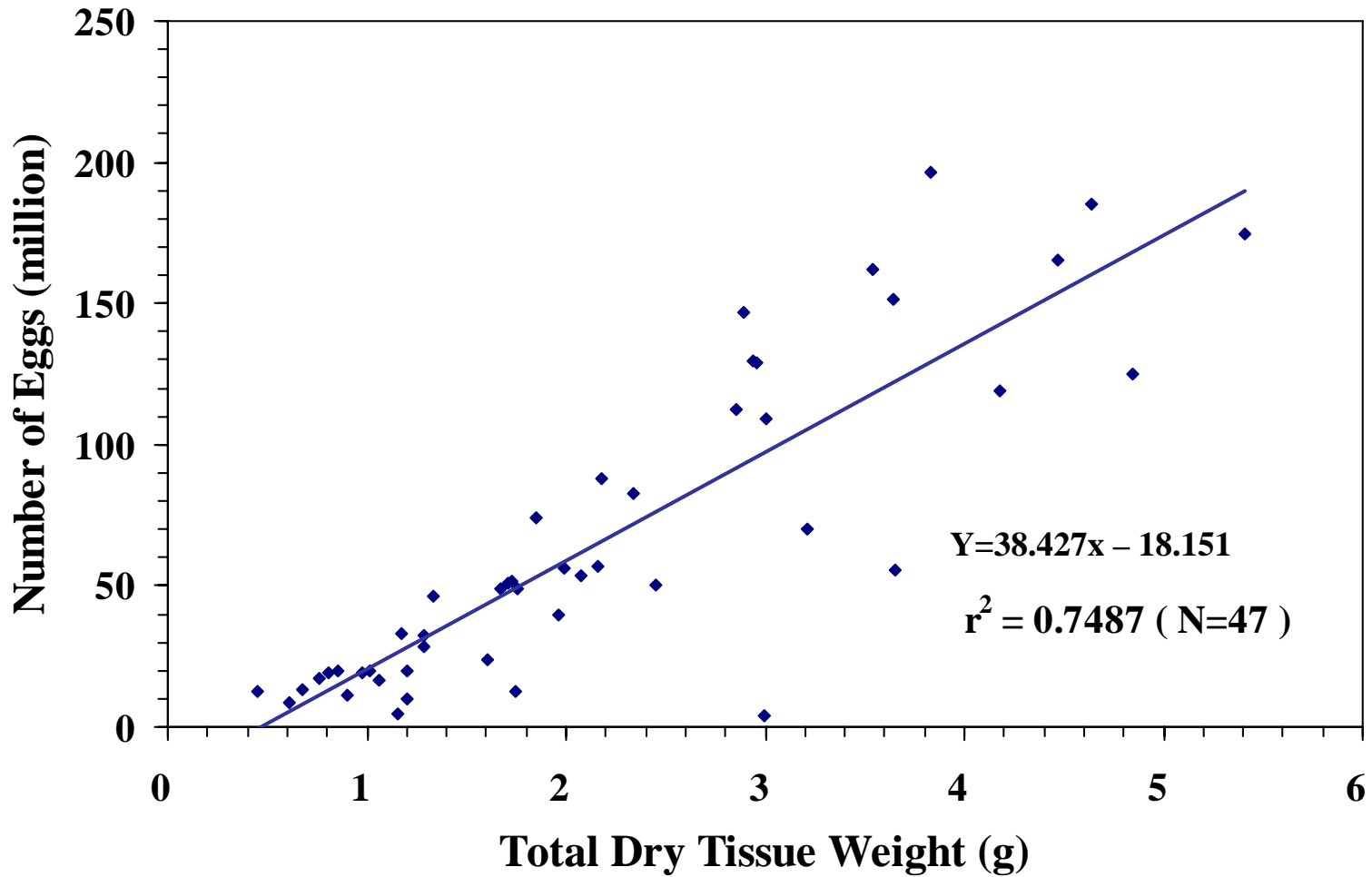


Fig 7. Correlation between oyster dry tissue weight and fecundity estimated from ELISA. Oysters were collected on 15 June and 27 July when oysters were fully ripe from Gosung bay (Kang et al., 2003).

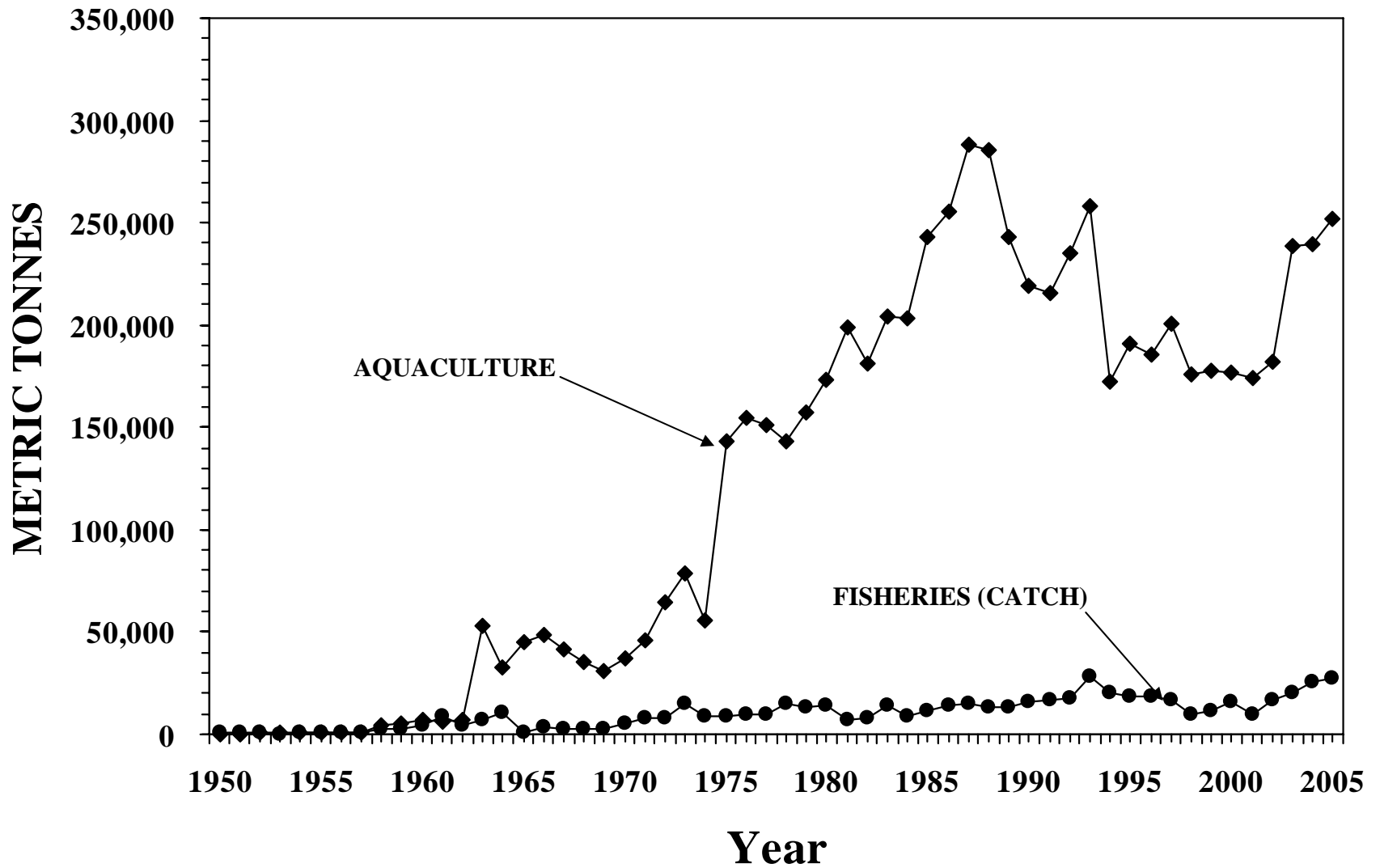


Fig 10. Oyster landings in Korea from 1950 to 2005 by quantity (metric tonnes)

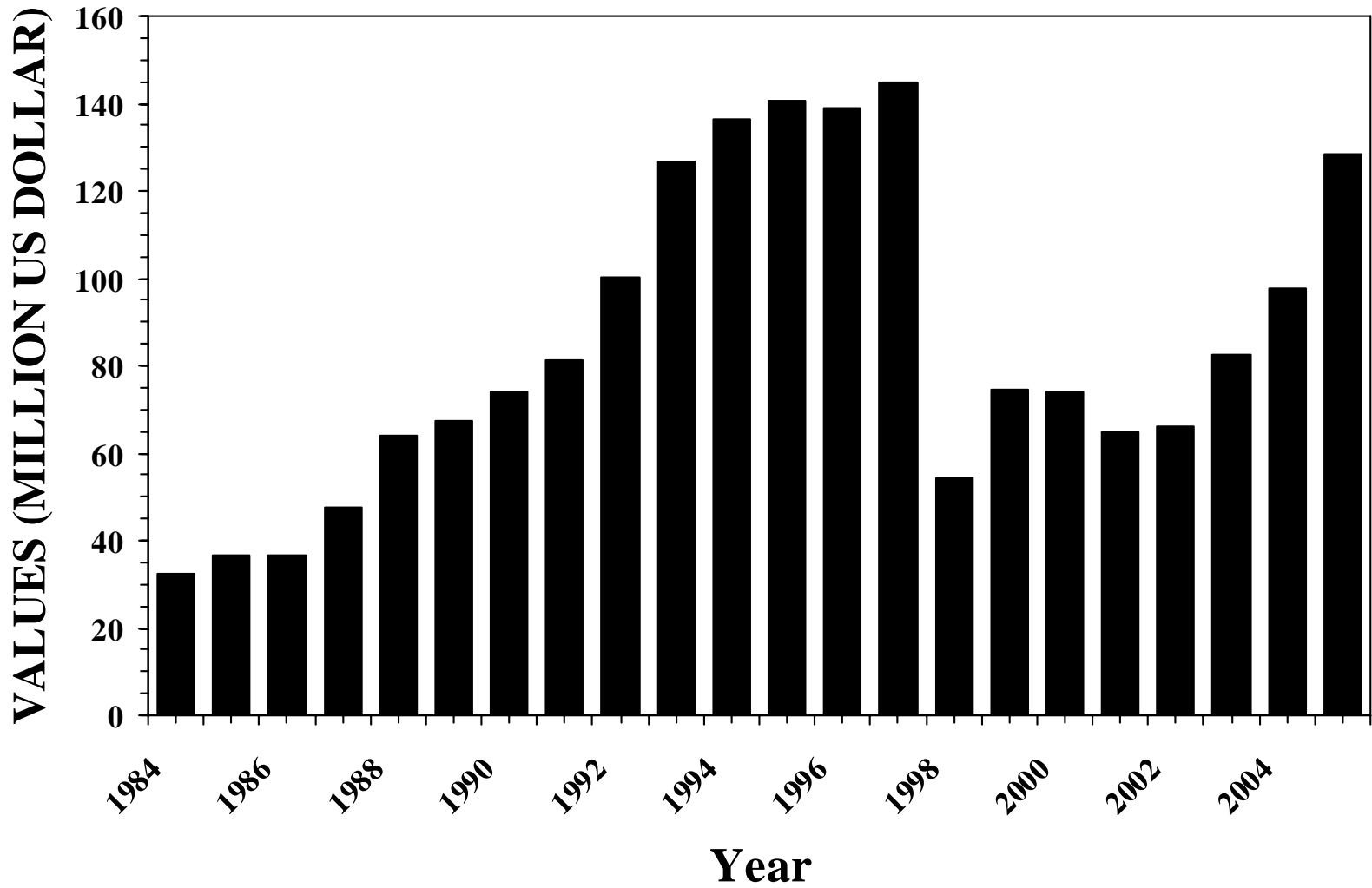


Fig 11. Oyster landings in Korea from 1985 TO 2004 by value (million US dollar)

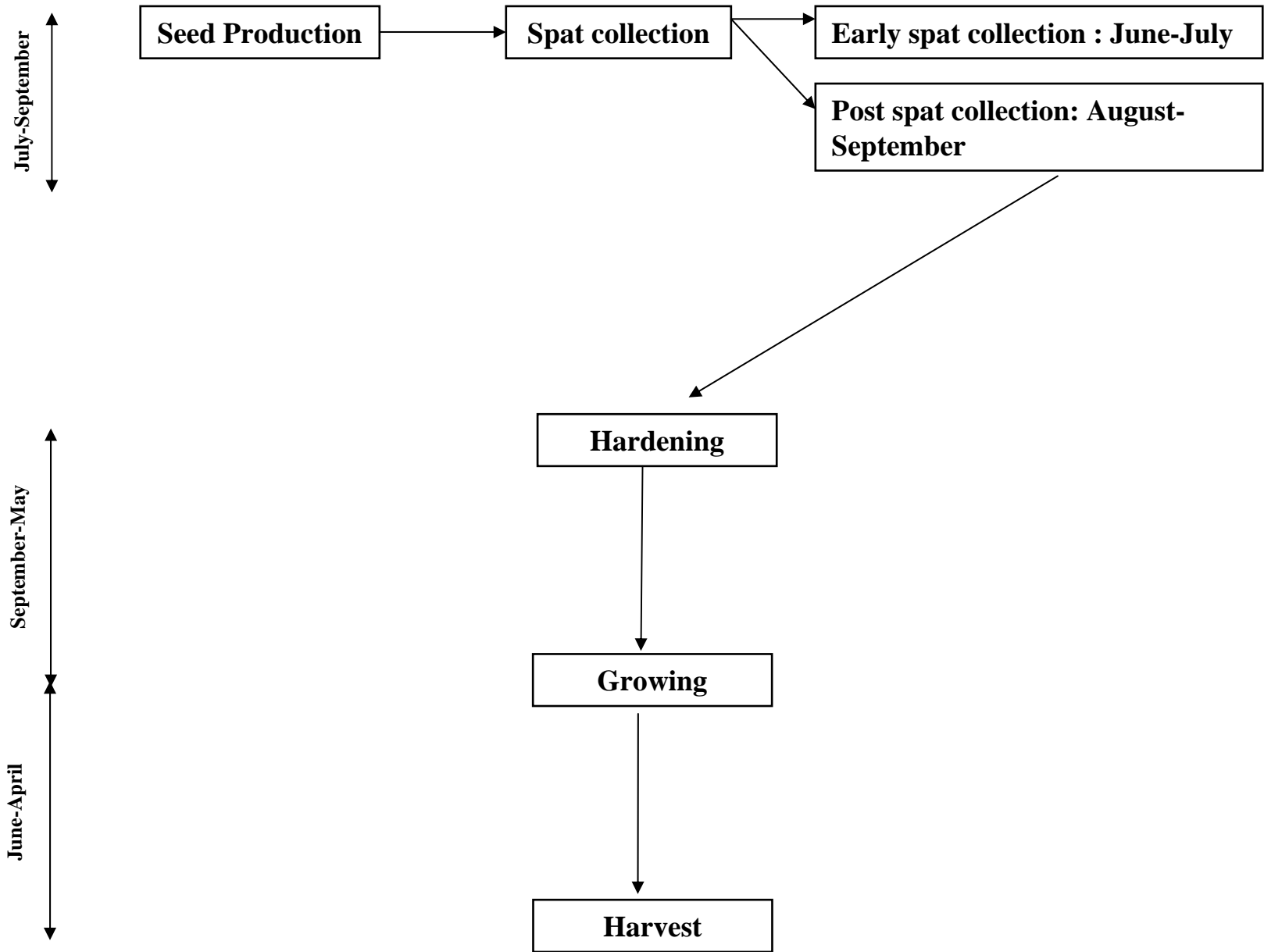


Fig 12. Suspended long line oyster culture procedure used in Korea



Fig 13. Assembling of oyster spat collectors using a plastic line and oyster shells.



A



B



C



D

Fig 14. Oyster spat collection in Korea. A, natural spat collection on intertidal area, B, rack system for the spat collection, C, oyster seed collectors suspended on the rack, D, oyster spat collection from boat.



Fig 15. Hardening newly settled oyster spat using racks placed in an intertidal zone in Gosung bay (Oyster Fisheries Cooperative of Korea)

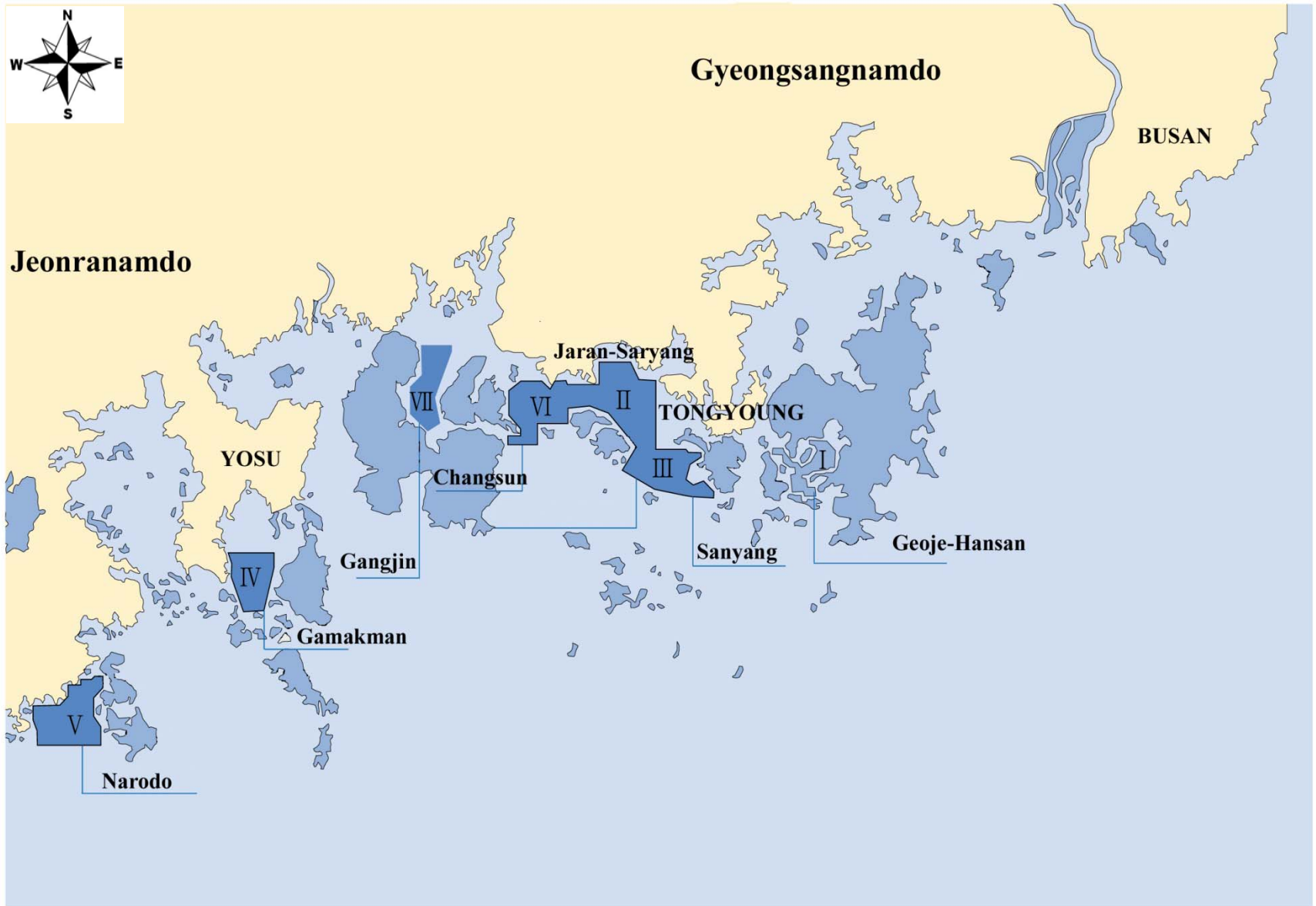


Fig 16. Map showing major oyster farming regions on the south coast of Korea.

Province	Oyster culture area	Number of oyster lease	Area (ha)	Number of long-line (each)	Number of oyster growout string (each)
Gyeongsangnamdo	Dosan Bay	89	439	7,651	1,910,000
	Saryang Bay	40	189	3,374	843,000
	Sanyang Bay	29	113	1,737	434,000
	Hansan Bay	32	152	1,235	308,000
	Jinhae Bay	183	825	15,609	3,820,000
	Geoja Bay	67	542	6,545	1,608,000
	Chilchun Island	33	166	3,119	779,000
	Gosung Bay	18	66	1,057	274,000
	Jaran Bay	135	747	12,497	3,140,000
	Masan Bay	30	128	2,261	584,000
	Namhae	27	164	2,906	1,048,000
Jeonranamdo	Gamakman Bay Goheung Gangjin	101	948	11,930	4,167,000
Total		784	4,479	69,921	19,015,000



Fig 17. The suspended long-line culture system in oyster growout fields off the south coast.

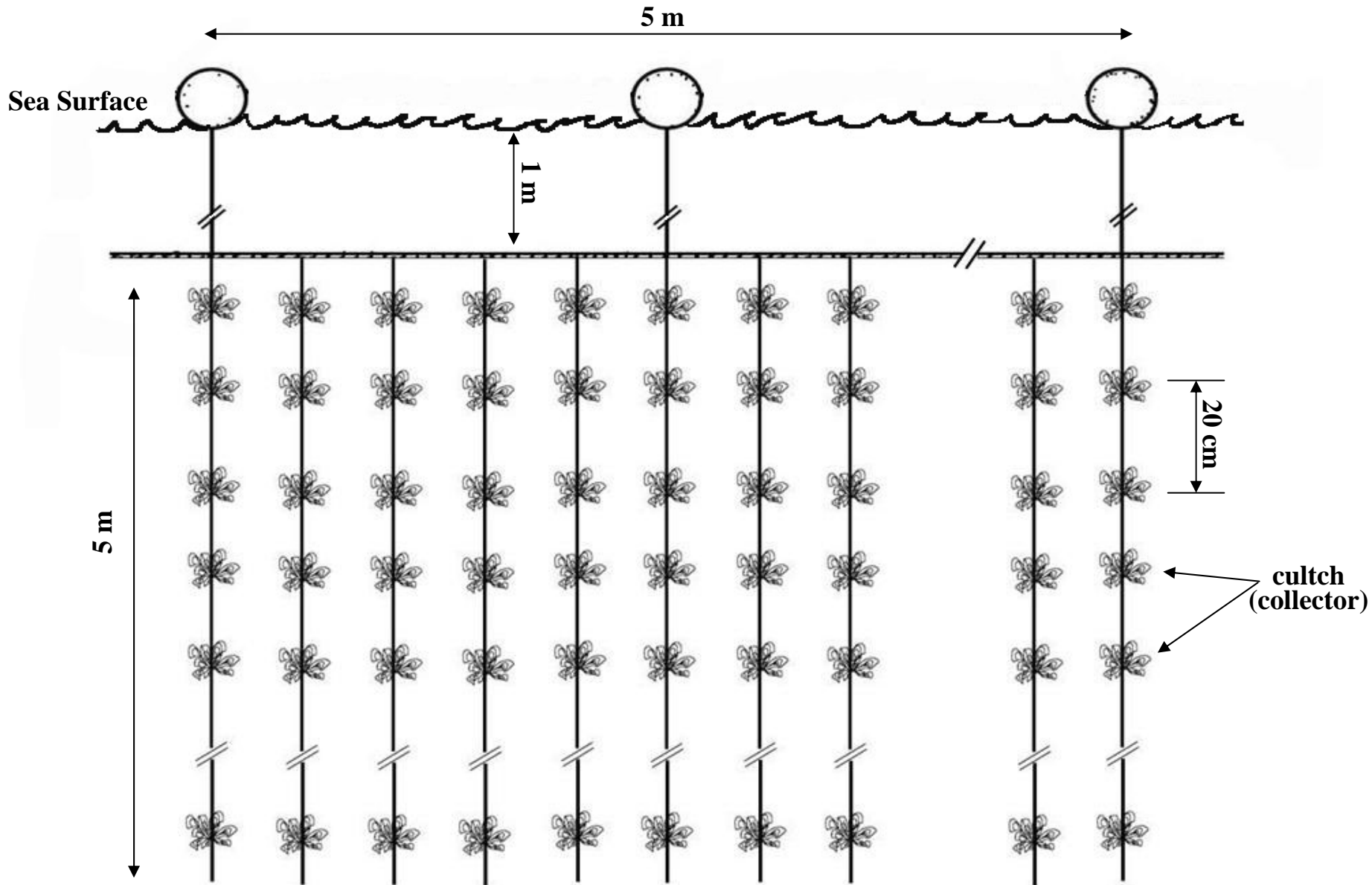


Fig 18. The oyster growout strings suspended on the long line system

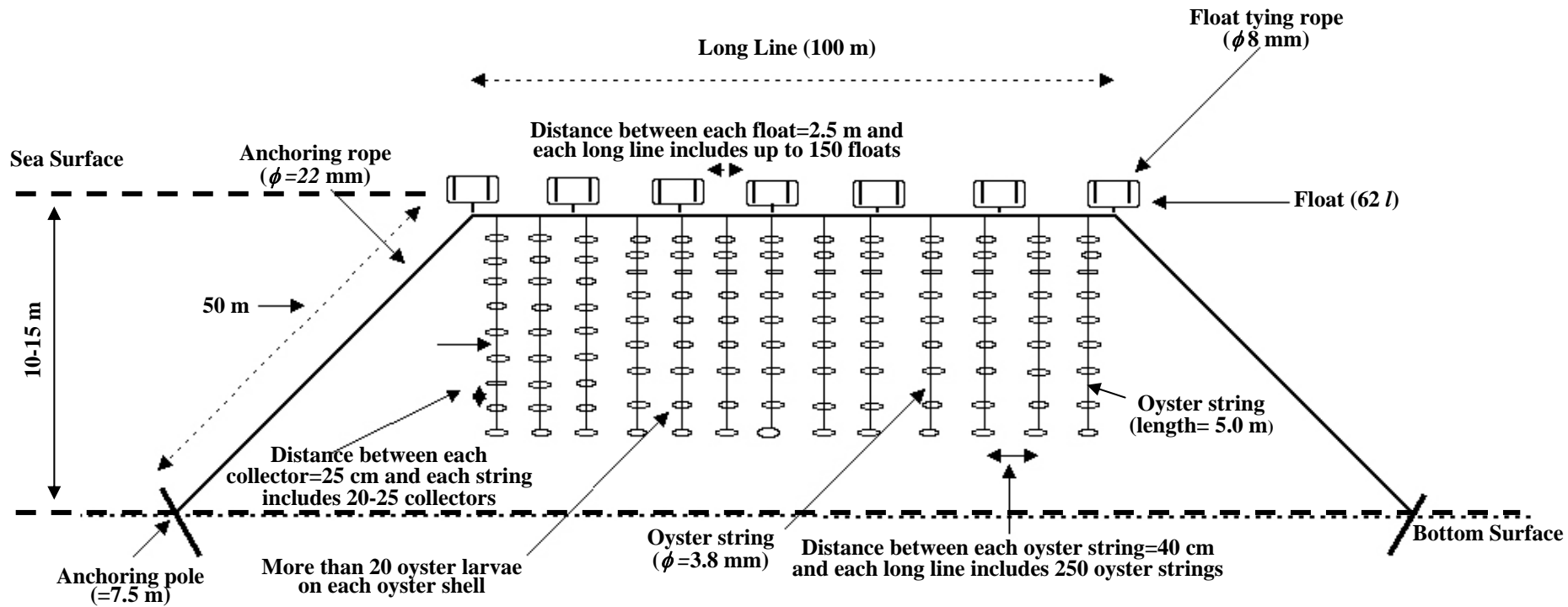


Fig 19. Side-view of the suspended long-line culture system used in the oyster culture.

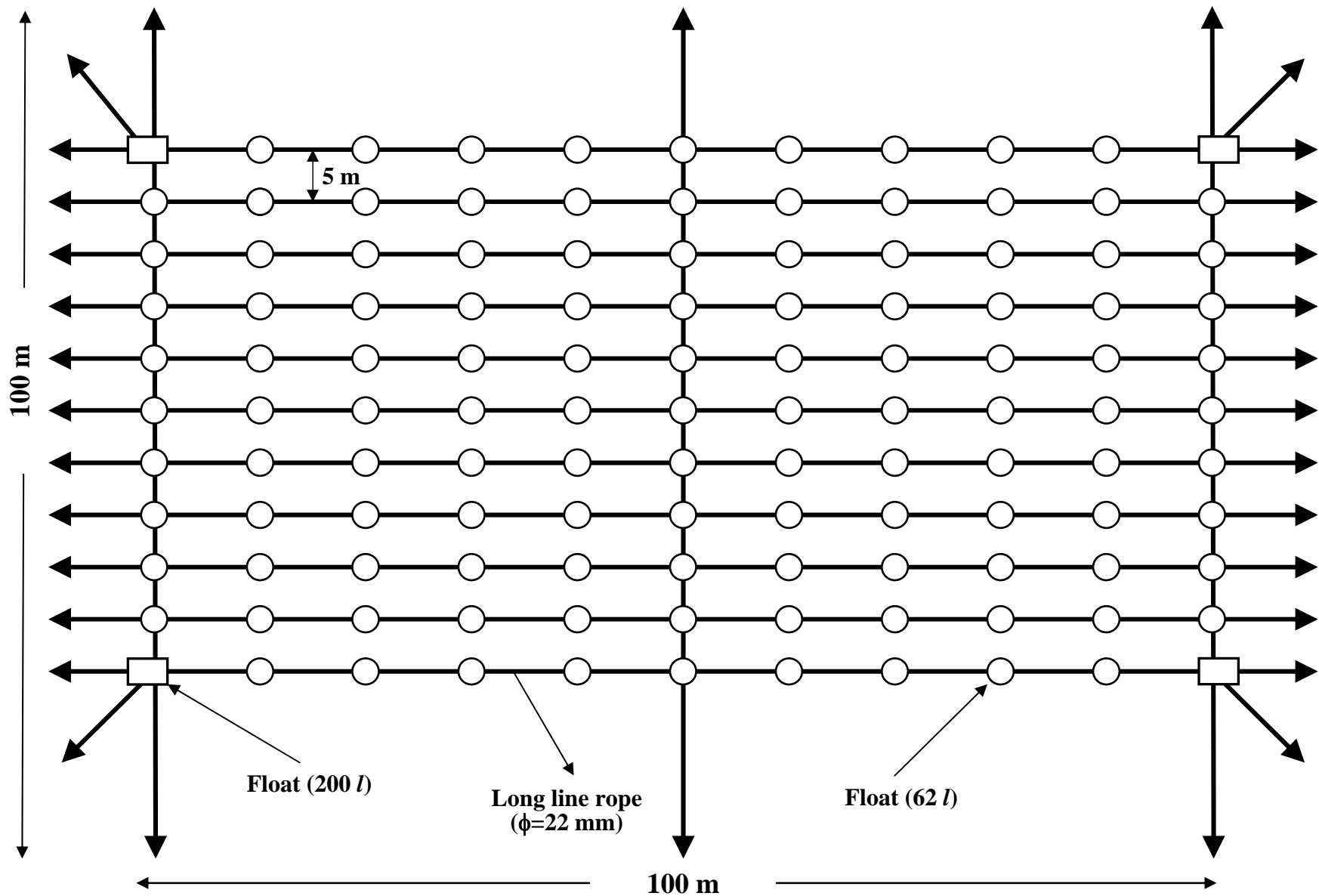


Fig 20. Over-view of the suspended long-line culture system used in the oyster culture.

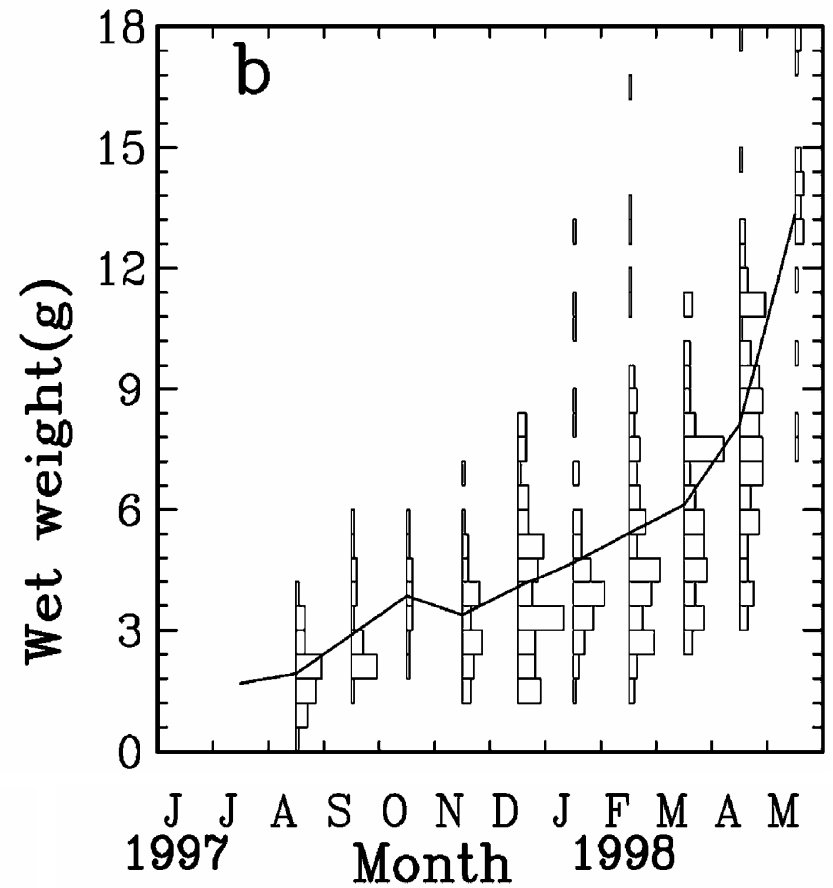
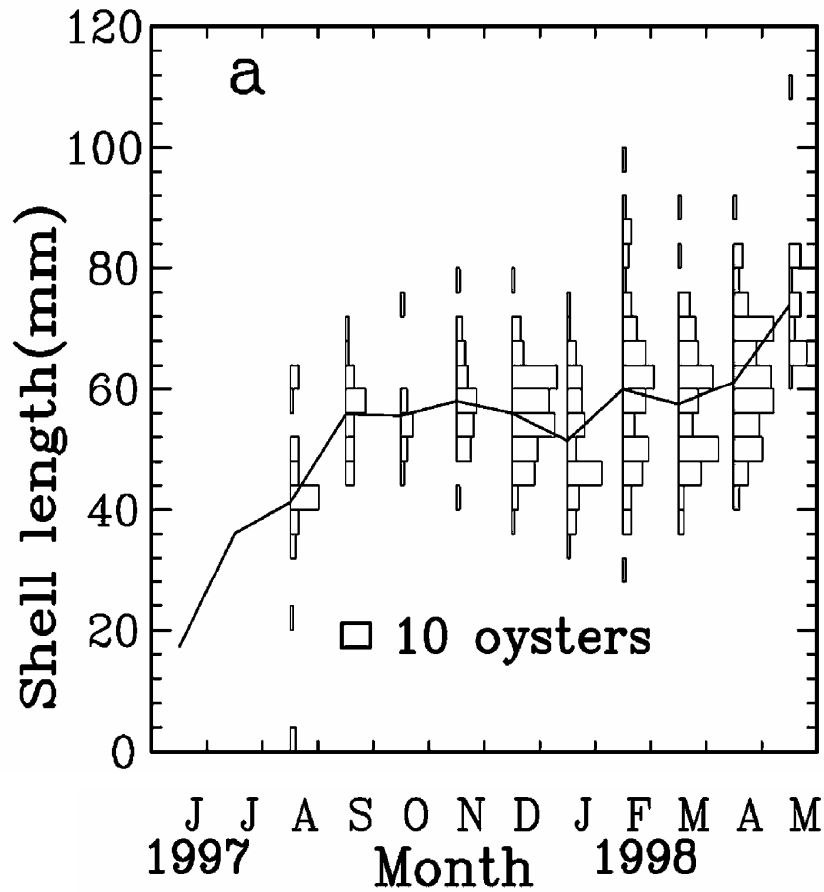


Fig 21. Oyster growth measured from a suspended long line culture system at Gamakman bay on the south-west coast of Korea (Hyun et al., 2001)

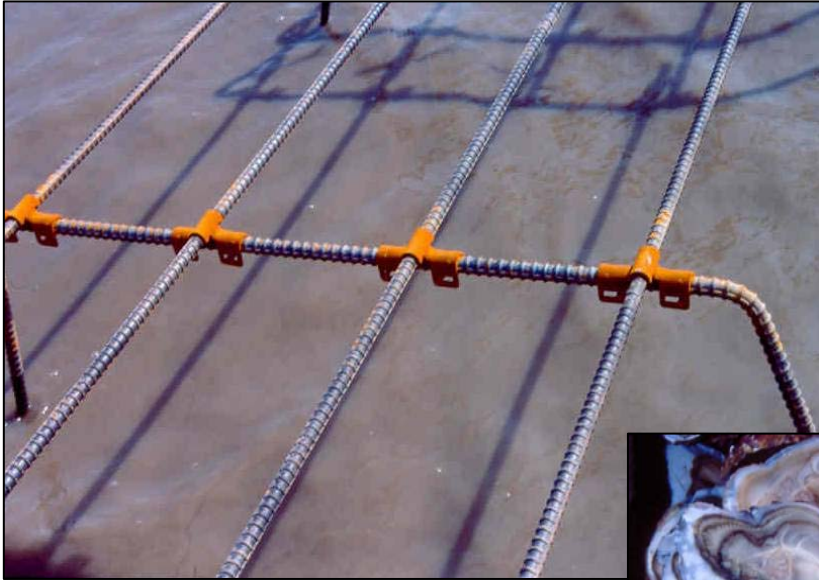


Fig 22. Harvesting oysters using an automatic oyster-string processor during April and May in Gosung bay off the south coast.



Fig 23. Shucking oysters at an oyster shucking factory. The oyster flesh is sorted by its size.

Intertidal Rack Culture System







Triploid oyster produced from the intertidal rack culture system



**Table 3 Quantity and value of oysters exported to other countries during
2002 and 2004**

Year/ Type	2002		2003		2004	
	Quantity (MT)	Vlu (US \$)	Qty (MT)	Value (US \$)	Qty (MT)	Value (US \$)
Fresh Meat	3,143	16,316,000	2,813	14,225,000	2,222	12,585,000
Frozen	7,215	26,852,000	7,057	27,360,000	7,010	33,139,000
Canned	6,155	27,729,000	6,031	26,947,000	4,919	25,138,000
Other	704	5,225,000	710	6,165,000	510	5,778,000
Total	17,217	76,122,000	16,611	74,697,000	14,661	76,640,000

Socio-economic Aspects of Oyster Farming in Korea

- **In Gyeongsangnamdo Province, 3,000 families are engaged in the oyster long-line aquaculture and they use 3,622 ha of the sea surface as the farming ground.**
- **In contrast, Jeonranamdo Province has only 406 oyster farming families using 948 ha of the sea surface as the farming ground.**
- **According to the Korea Oyster Long-Line Culture Cooperative, there are 22,000 full-time jobs in the oyster industry in 1) long-line culture itself, 2) oyster shucking factory and 3) oyster processing.**

Profit from Oyster Farming?

- **In 2003, one oyster farming family worked on 126 oyster long-lines**
- **The family spent 172 working days and hiring 231 temporary employees with none permanent employees**
- **The family produced 297 MT of oyster including shells, which was equivalent to 134,389 US Dollars**
- **After excluding the costs used in the seed purchase, the repairing costs and wages of the employee, the net profit become 33,000 US Dollars for this family**

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