International Council for the
Exploration of the Sea

C.M. 1974/M: 9
Anadromous and Catadromous
Fish Committee

On Fecundity and Seasonal Growth of Ovocytes in Sea Trout of the Kiel Bay

by V.Hilge

Institut für Küsten- und Binnenfischerei,
Hamburg
present address: Centre Océanologique de
Bretagne, 29 N- Plouzané,Boite Postale 337

Introduction

This paper presents that part of an investigation on intra-ovarial development in teleosts which is concerned with Sea Trout (Hilge,1972). From June 1959 to August 1960 a number of 97 female Sea Trout has been sampled from catches taken in the Kiel Bay or in waters adjacent to it (Table 1). The ovaries were kept in Gilson's fluid and the ovocytes were measured at a later date. No special attention was devoted then to the group of smallest germ cells, the "resting ovocytes". 38 ovaries have been used for fecundity estimates.

Seasonal maturation of ovocytes

Three groups of germ cells have been recorded, which were classified according to their status of development. Small ovocytes represent a stock which apparently shows no development during most of the season. Residual eggs have been left over from the last spawning. They are present in small numbers. Ripening ovocytes are in the process of rapid maturation. Fig. 1 shows frequency distributions of egg sizes, the quantity of the three groups relativ to each other not being representative for the distribution in the ovary.

The differentiation of ripening ovocytes apparently occurs in spring. They reach their final size at the end of the year. But mature females were even found in February. Small numbers of residual eggs were noted between March and July after the spawning season. The frequency curves of "resting ovocytes" from September onwards show a tendency towards increasing skewness from which eventually two curves emerge. Quite obviously, "resting ovocytes" exist for one year until some of them have developed into ripening ovocytes and then in turn need one year of growth to become mature eggs. It can therefore be concluded from this exercise that the intraovarial development of Sea Trout eggs takes at least two years. More detailed investigations in marine species do suggest, however, that this process lasts at least four years in

a fish which has spawned already once (Hilge,1972).

Fecundity

Figure 2 shows the relationship between total length and number of eggs. For fish of a length of 45 cm to 74 cm this can be expressed by the linear equation

$$y = 94{,}5\,x - 542.$$

$(r = 0.814 > r_{0.001} = 0.52)$

$(f = 70.9 > f_{0.01} = 7.40)$

The correlation is highly significant. The f- test shows that the number of eggs depends on the total length of fish.

References

HILGE, V. (1972) Die Entwicklung des Teleosteerovars als Grundlage für die Reifebestimmung. Diss. Kiel

Tab. 1 Distribution of the average diameter of the ovocytes of Sea Trout of the Kiel Bay

Month of catch	Length (cm)	Number of Sea Trout	Average diameter of ovocytes (mm)		
			resting ovocytes	ripening ovocytes	residual eggs
VI 59	54 - 63	2	0,437	1,537	4,44
VII 59	55 - 67	2	0,421	2,563	5,23
VIII 59	55	1	0,686	3,76	
IX 59	46 - 62	15	0,454	3,414	
X 59	46 - 67	9	0,371	4,20	
XI 59	50 - 74	3	0,465	5,15	
XII 59	34 - 74	7	0,656	5,313	
I 60	73	1	0,621	5,66	
II 60	39 - 61	12	0,279	0,842	
III 60	53 - 76	3	0,257	0,845	5,07
IV 60	38 - 71	30	0,344	1,041	
V 60	47 - 60	2	0,332	1,015	4,39
VI 60	52	1	0,324		
VII 60	29 - 59	7	0,228	1,433	
VIII 60	52 - 59	2		2,116	

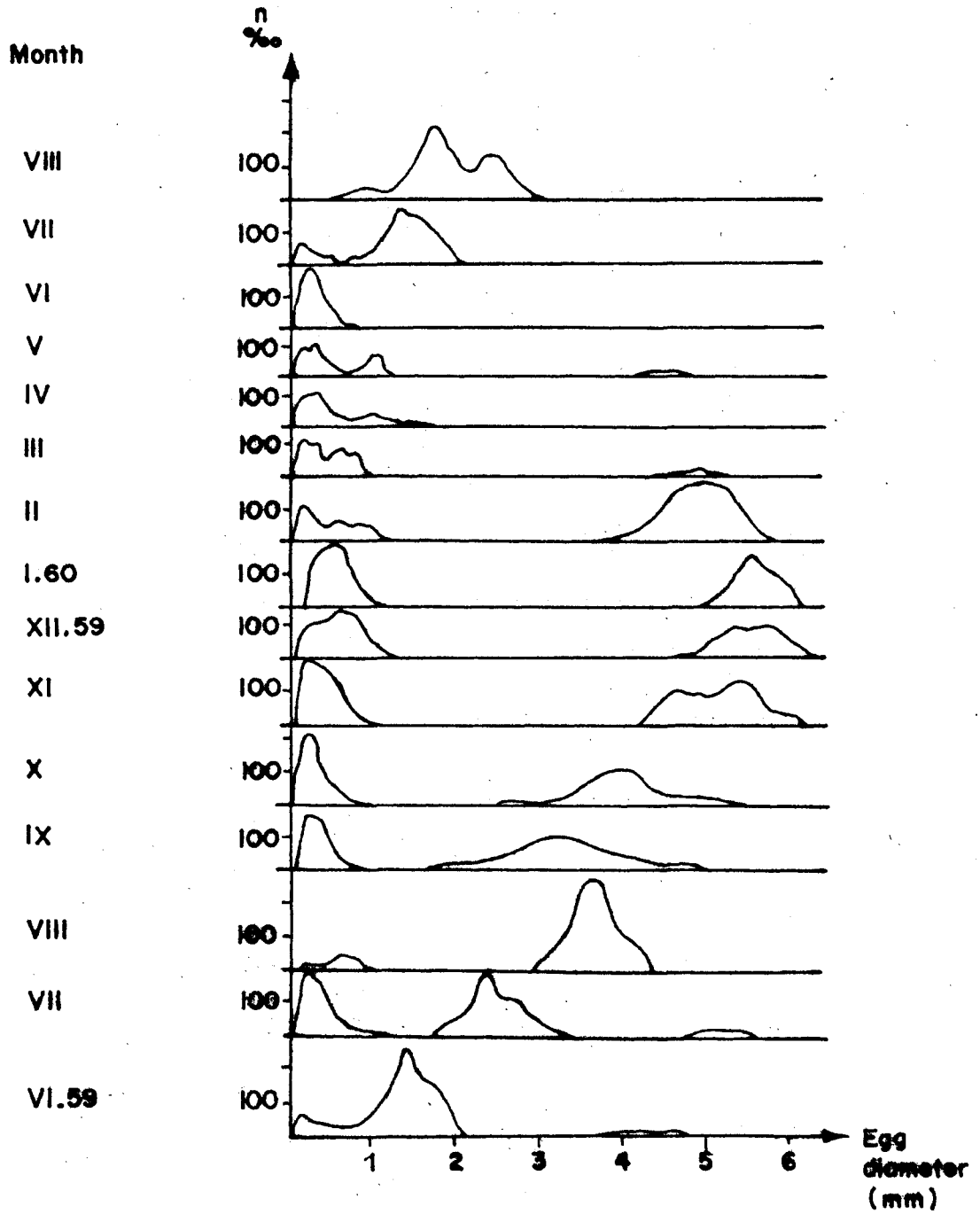

Fig. 1 The maturation of the ovocytes of the Sea Trout

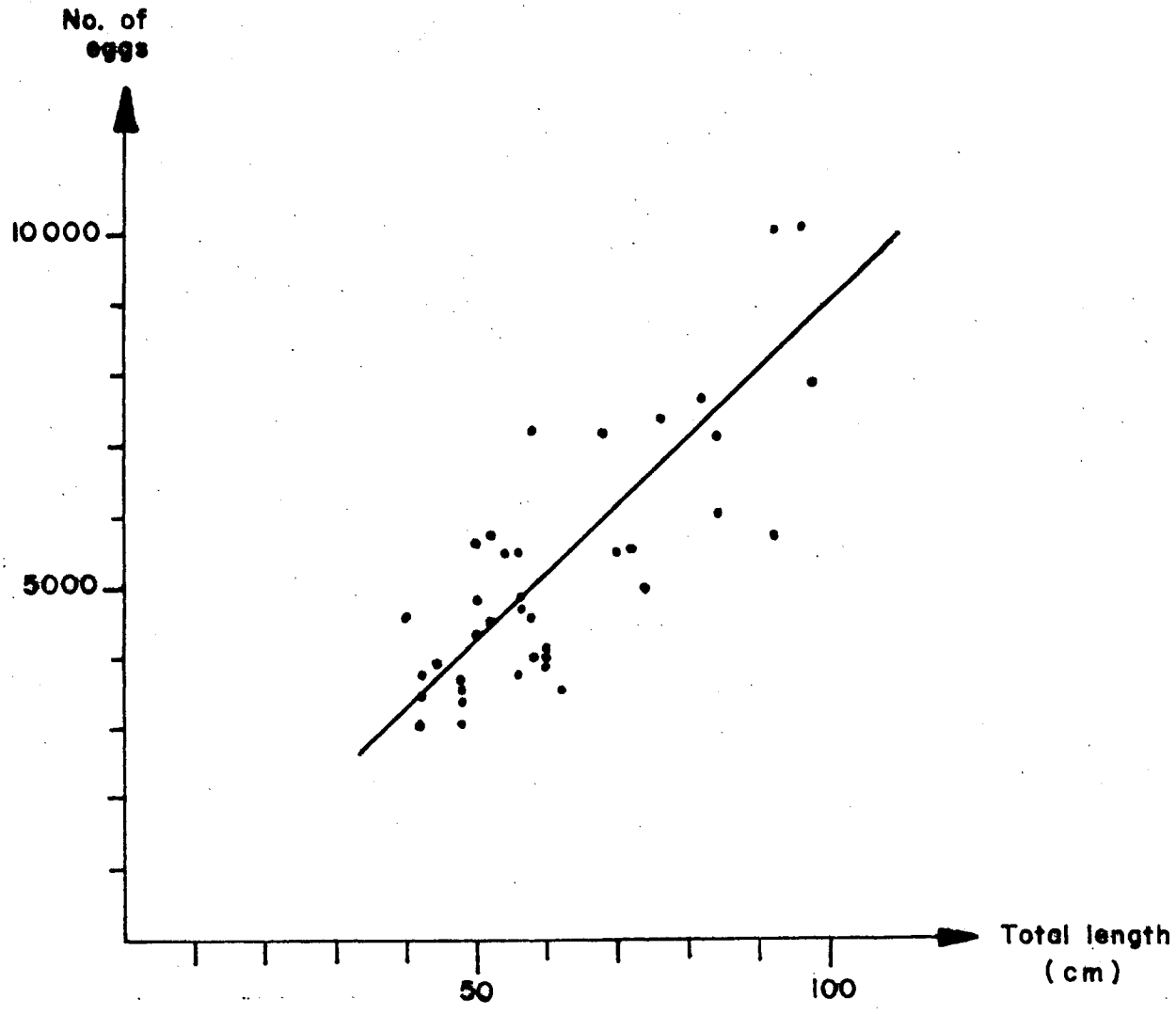

Fig. 2 The relationship between total length and number of eggs in Sea Trout of the Kiel Bay

International Council for the Exploration of the Sea

C.M. 1974/M: 9
Anadromous and Catadromous Fish Committee

On Fecundity and Seasonal Growth of Ovocytes in Sea Trout of the Kiel Bay

by V.Hilge

Institut für Küsten- und Binnenfischerei, Hamburg
present address: Centre Océanologique de Bretagne, 29 N- Plouzané, Boite Postale 337

Introduction

This paper presents that part of an investigation on intra-ovarial development in teleosts which is concerned with Sea Trout (Hilge,1972). From June 1959 to August 1960 a number of 97 female Sea Trout has been sampled from catches taken in the Kiel Bay or in waters adjacent to it (Table 1). The ovaries were kept in Gilson's fluid and the ovocytes were measured at a later date. No special attention was devoted then to the group of smallest germ cells, the "resting ovocytes". 38 ovaries have been used for fecundity estimates.

Seasonal maturation of ovocytes

Three groups of germ cells have been recorded, which were classified according to their status of development. Small ovocytes represent a stock which apparently shows no development during most of the season. Residual eggs have been left over from the last spawning. They are present in small numbers. Ripening ovocytes are in the process of rapid maturation. Fig. 1 shows frequency distributions of egg sizes, the quantity of the three groups relativ to each other not being representative for the distribution in the ovary.

The differentiation of ripening ovocytes apparently occurs in spring. They reach their final size at the end of the year. But mature females were even found in February. Small numbers of residual eggs were noted between March and July after the spawning season. The frequency curves of "resting ovocytes" from September onwards show a tendency towards increasing skewness from which eventually two curves emerge. Quite obviously, "resting ovocytes" exist for one year until some of them have developed into ripening ovocytes and then in turn need one year of growth to become mature eggs. It can therefore be concluded from this exercise that the intraovarial development of Sea Trout eggs takes at least two years. More detailed investigations in marine species do suggest, however, that this process lasts at least four years in

a fish which has spawned already once (Hilge,1972).

Fecundity

Figure 2 shows the relationship between total length and number of eggs. For fish of a length of 45 cm to 74 cm this can be expressed by the linear equation

$$y = 94{,}5\,x - 542.$$

$(r = 0.814 > r_{0.001} = 0.52)$

$(f = 70.9 > f_{0.01} = 7.40)$

The correlation is highly significant. The f- test shows that the number of eggs depends on the total length of fish.

References

HILGE, V. (1972) Die Entwicklung des Teleosteerovars als Grundlage für die Reifebestimmung. Diss. Kiel

Tab. 1 Distribution of the average diameter of the ovocytes of Sea Trout of the Kiel Bay

Month of catch	Length (cm)	Number of Sea Trout	Average diameter of ovocytes (mm)		
			resting ovocytes	ripening ovocytes	residual eggs
VI 59	54 - 63	2	0,437	1,537	4,44
VII 59	55 - 67	2	0,421	2,563	5,23
VIII 59	55	1	0,686	3,76	
IX 59	46 - 62	15	0,454	3,414	
X 59	46 - 67	9	0,371	4,20	
XI 59	50 - 74	3	0,465	5,15	
XII 59	34 - 74	7	0,656	5,313	
I 60	73	1	0,621	5,66	
II 60	39 - 61	12	0,279	0,842	
III 60	53 - 76	3	0,257	0,845	5,07
IV 60	38 - 71	30	0,344	1,041	
V 60	47 - 60	2	0,332	1,015	4,39
VI 60	52	1	0,324		
VII 60	29 - 59	7	0,228	1,433	
VIII 60	52 - 59	2		2,116	

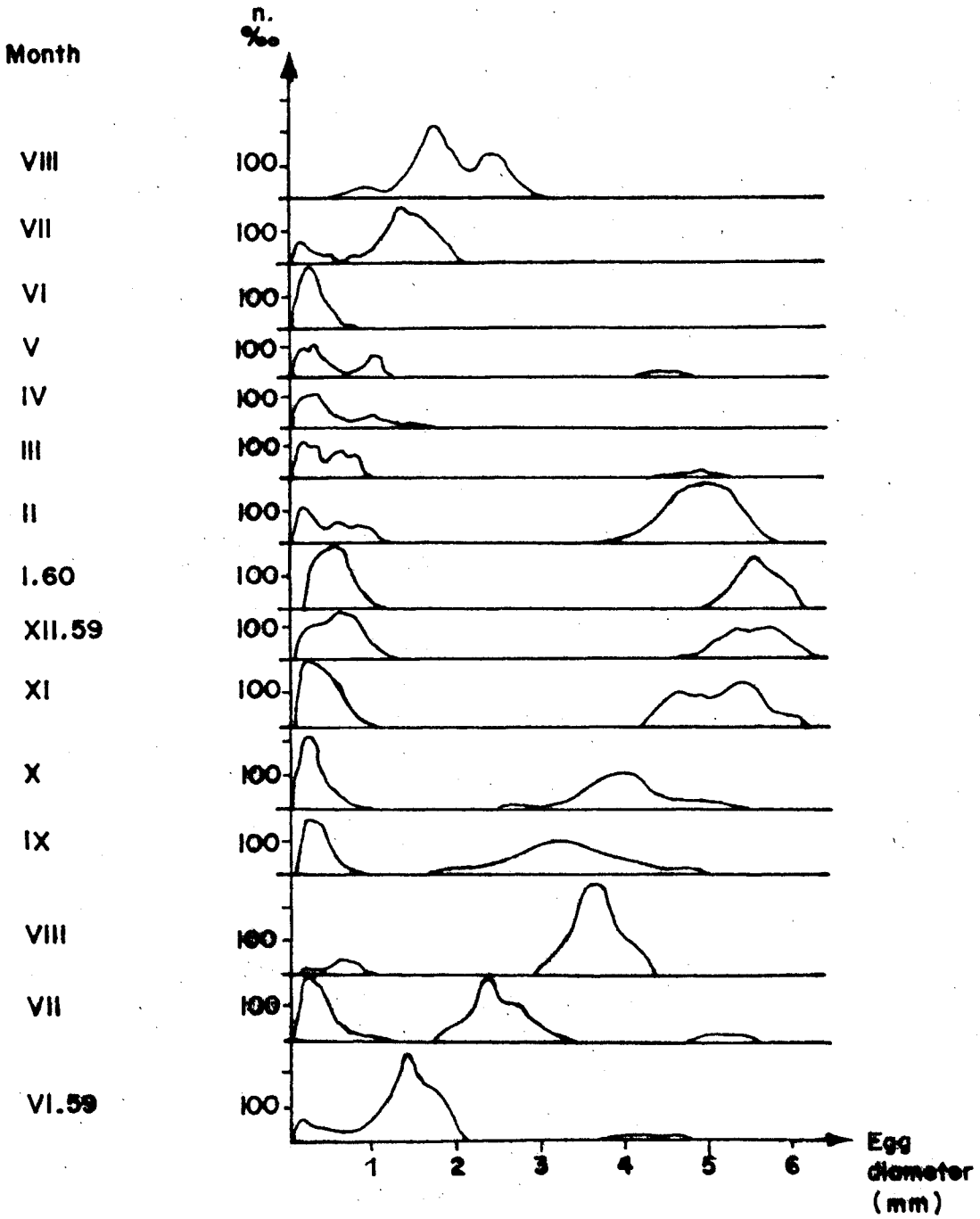

Fig. 1 The maturation of the ovocytes of the Sea Trout

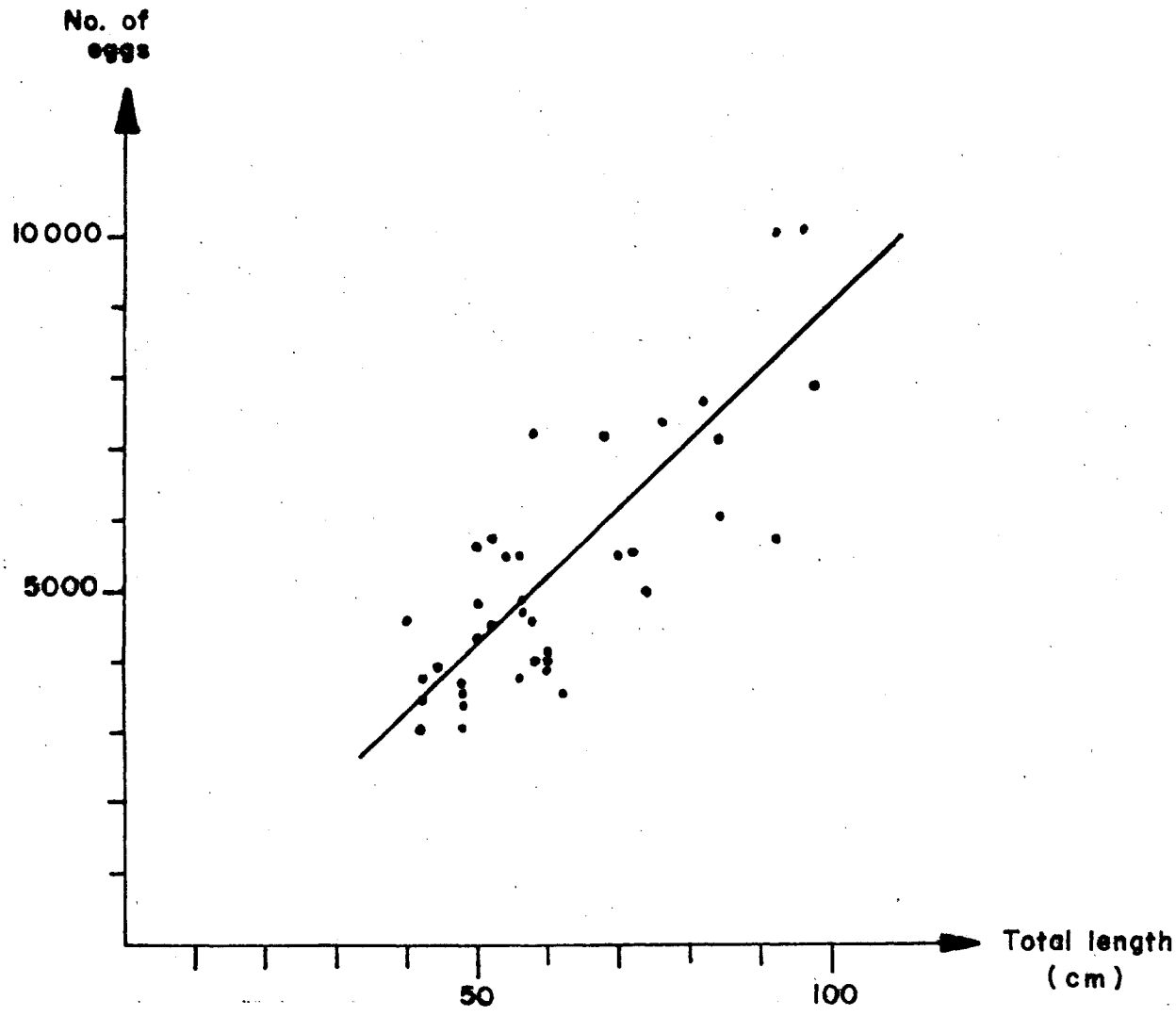

Fig. 2 The relationship between total length and number of eggs in Sea Trout of the Kiel Bay