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A NOMOGRAPH FOR THE VARIOUS CHARACTERS OF THE SCIAENID FISH *PENNAHIA ANEUS* (BLOCH).

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ABSTRACT

Nomograph of four characters such as standard length, otolith length, scale length and weight are drawn in relation to total length, based on 580 specimens of the sciaenid fish *Pennahia aneus.*

Nomographs are used in Engineering and Agricultural science to find out the interrelation between more than two characters and to determine the unknown value from the two known values of the interrelated characters. (Swett 1928; Allcock and Jones 1932; Mavis 1939). Nomographs were employed by Carlander and Smith (1944) in fishery biology for the study of growth rate in fishes. In the present study the use of nomograph is extended to find the relation between different characters of the fish.

Total length, standard length, scale length (scales taken from pectoral axilla), otolith (sagittal) length and the weight of 580 specimens of the sciaenid fish *Pennahia aneus* of the size range 80 to 200 mm were used for the investigation. Total length was taken as a dependent variable and the other characters as independent variables. Length-weigth relation was converted to logarithmatic scale so as to fit to an equation of linear form.

The linear equation $Y = a + bx$, where Y is the dependent variable, X, the independent variable and a and b are the constants to be determined by the method of least square, is used.

By using the data the following equations were obtained:

$$Y_1 = -7.6647 + 0.08546\ X \quad \ldots\ldots\ (1)$$
$$\text{Log}\ Y_2 = -4.2800 + 3.1887\ \text{Log}\ X \quad \ldots\ldots\ (2)$$
$$Y_3 = -0.2911 + 0.0248\ X \quad \ldots\ldots\ (3)$$
$$Y_4 = 1.1012 + 0.0359\ X \quad \ldots\ldots\ (4)$$

Where Y_1, log Y_2, Y_3 and Y_4 are the standard length, weight, scale length, and otolith length respectively and X the total length. From the equation (1), (2), (3) and (4) the equations (5), (6) (7) and (8) were obtained by solving for X.

$$X = 1.1701\ Y_1 + 8.9685 \quad \ldots\ldots\ (5)$$
$$\text{Log}\ X = (0.3136)\ \log\ Y_2 + 1.3422 \quad \ldots\ldots\ (6)$$
$$X = 40.3226\ Y_3 + 11.6936 \quad \ldots\ldots\ (7)$$
$$X = 27.8552\ Y_4 - 30.6407 \quad \ldots\ldots\ (8)$$

Table 1. *Relationship between total length and standard length* (mm)

X	67	79	91	102	114	126	137	149	161	173	184	196	208	220
Y_1	50	60	70	80	90	100	110	120	130	140	150	160	170	180

X = Total length; Y_1 = Standard length

Table 2. *Relationship of total length and weight.* (mm)

X	93	116	131	144	154	163	171	179	185	192	198	203	208	213
Y_2	100	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400

X = Total length; Y_2 = weight from the formula (6)
the above table is got by finding the log and anti log.

Table 3. *Relatioship between total length and scale length* (mm)

X	52	92	132	173	213
Y_3	1	2	3	4	5

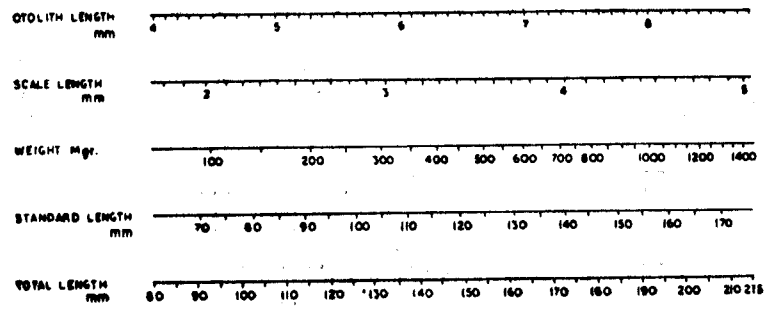
X = Total length; Y_3 = Scale length

Table 4. *Relationship of total length and otolith length* (mm)

X	81	108	136	164	192	220
Y_4	4	5	6	7	8	9

X = Total length; Y_4 = Otolith length

Table 1, 2, 3, 4 are obtained by using the above formulae (5), (6), (7) & (8) respectively and the nomograph is drawn from them (Fig. below. From the nomograph, if any corresponding value of two characters are fixed from the Tables, the intermediate values as well as other unknown values of any character can be determined.



For example, total length 132 mm is taken and the corresponding scale length is 3 mm. From the line connecting these two points, values for other characters can be found out. This method is evidently useful for calculating the unknwon values if any of the corresponding values of two characters are known.

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