INDEX OF RELATIVE IMPORTANCE - A NEW METHOD FOR ASSESSING THE FOOD HABITS OF FISHES

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A new Index is proposed to study the relatively important food items of fishes.

Analyses of the stomach contents are the only source in elucidating the food habit of fishes. The well known methods applied in the analyses of the stomach contents are (a) numerical, (b) volumetric and (c) gravimetric. Hynes (1950) has breifly reviewed the methods of gut content analyses in fishes and has expressed that any commonly accepted method of assessing the composition of the diet will give substantially the same result. Pillay (1952) discussed the defects and advantages of various methods employed in the study of food fishes and suggested that volumetric analysis of gut contents was the most satisfactory of all other methods.

Two indices, combining volumetric and numerical methods, are in current employment for grading the food elements. The Index of Preponderence proposed by Natarajan and Jhingran (1962) provides a definite and measurable basis for grading various food elements as it gives a combined picture of frequency of occurrence as well as volume. In the Index of Relative Importance proposed by Pinkas (1971), percent volume and percent number are added up, weighted by the frequency of occurrence.

This paper describes the construction of a new Index for analysing the stomach contents of fishes combining numerical and volumetric methods.

The proposed Index of Relative Importance is built up considering the unit volume of food items weighted by its frequency of occurrence and expressed as percentage, *ie.*

$$\frac{\dfrac{V_i \times F_i}{N_i}}{\Sigma \dfrac{V_i \times F_i}{N_i}} \times 100$$

where: V_i = volume of the food item
F_i = frequency of occurrence of the food item and
N_i = Food item in number.

Table 1 shows the analyses of the stomach contents of Bombay duck by two existing indices and by the proposed Index of Relative Importance. A perusal of the analyses by the first two indices (section A and B) indicates that *Acetes* sp., *Harpodon nehereus* and *Palaemon* sp. constitute the 1st, 2nd and 3rd ranks respectively whereas the analyses by the proposed Index of Relative Importance (section C) shows that *Harpodon nehereus, Palaemon* sp. and *Acetes* sp. took the ranks in that order.

Table 1. *Grading of the stomach contents of the*

Food Organisms	Volume in cc (V_i)	Percent Volume (v_i)	Number (N_i)	Percent Number (n_i)	Frequency of Occurrence (F_i)	Percent Frequency of Occurrence (f_i)
Acetes sp.	186.25	55.51	741	91.48	43	53.75
Palaemon sp.	19.50	5.81	5	0.62	4	5.00
Coilia sp.	4.50	1.34	2	0.25	2	2.50
Bregmaceros sp.	2.00	0.60	2	0.25	1	1.25
H. nehereus	121.75	36.29	59	7.28	29	36.25
Sciaenids	1.50	0.45	1	0.12	1	1.25
Total	335.50	100.00	810	100.00	80	100.00

In the grading of food items by the Index of Preponderence, the volume of the food item is taken into consideration. Since the prey ingested varies in size, the volume is variable; the number of organisms that provided the volume is not taken into consideration in this Index. This Index would have had greater effect if the unit volume was equal for all food items. The Index of Relative Importance proposed by Pinkas (*op. cit*) on the other hand adds up two independant factors, viz. the number and volume of the food items, each of which would built up as an Index if the unit volume per organism was indentical. But the present Index of Relative Importance is bult up considering unit volume weighted by the frequency of occurrence and expressed as percentage.

Bombay duck employing three indices.

A			B		C		
Index of Preponderence (Natarajan and Jhingran)		Rankings	Index of Relative Importance (Pinkas)	Rankings	Proposed Index of Relative Importance		Ranking
$v_i x f_i$	$\frac{v_i x f_i}{\Sigma v_i x f_i} x 100$		$(v_i x f_i) f_i$		$\frac{V_i x F_i}{N_i}$	$\frac{\frac{V_i x F_i}{N_i}}{\Sigma \frac{V_i x F_i}{N_i}} x 100$	
2983.66	68.86	I	7900.71	1	10.81	11.59	III
29.05	0.67	III	32.15	III	15.60	16.73	II
3.35	0.08	IV	3.97	IV	4.50	4.83	IV
0.75	0.02	V	1.06	V	1.00	1.07	VI
1315.51	30.36	II	1579.41	II	59.84	64.17	I
0.56	0.01	VI	0.71	VI	1.50	1.61	V
Σ4332.88	100.00				Σ93.25	100.00	

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