

**CHAPTER SIX**

**RESULTS  
OF  
BIOLOGICAL PARAMETERS**

## CHAPTER -VI

**CHART NO. 1 SHOWING GONADO SOMATIC RATIO OF *M. dayanum* (Male)**

Months & Seasons		Weight of <i>M. dayanum</i> (Av.)	Length of <i>M. dayanum</i> (Av.)	Weight of Gonad (Av.)	GSR	K-Factor
December	Winter	1.78-5.10 3.4	32.4-70.8 51.6	0.16	4.7	0.0025
January		1.76-5.10 3.4	34.2-68.4 51.3	0.12	3.5	0.0026
February		1.70-4.95 3.3	28.6-64.2 46.4	0.08	2.4	0.0033
March	Pre Monsoon	1.82-4.96 3.4	44.4-60.2 52.3	0.07	2.05	0.0023
April		1.84-4.96 3.4	45.1-62.4 53.8	0.15	4.4	0.0022
May		1.86-5.08 3.5	44.8-65.2 55.0	0.18	5.1	0.0021
June	Monsoon	2.08-5.60 3.8	52.4-76.2 64.3	0.20	5.2	0.0020
July		2.10-5.62 3.9	52.8-80.5 66.9	0.23	5.8	0.0014
August		2.15-5.75 3.9	54.5-93.0 73.6	0.25	6.4	0.0028
September		2.18-5.68 4.1	53.2-82.5 67.8	0.28	7.1	0.0013
October		Retreating Monsoon	1.98-5.08 3.6	46.5-78.4 62.5	0.22	6.2
November	1.82-5.02 3.5		38.1-70.4 54.3	0.18	5.2	0.0022

**CHART NO.2 SHOWING GONADO SOMATIC RATIO *M. dayanum* (Female)**

Months & Seasons		Weight of <i>M. dayanum</i> (Av.)	Length of <i>M. dayanum</i> (Av.)	Weight of Gonad (Av.)	GSR	K-Factor
December	Winter	3.5	50.5	0.31	8.86	0.0027
January		3.0	48.5	0.25	8.3	0.0026
February		3.2	45.6	0.28	8.75	0.0034
March	Pre Monsoon	3.5	50.3	0.25	7.14	0.0028
April		3.8	56.7	0.28	7.36	0.0021
May		4.0	55.8	0.33	8.25	0.0023
June	Monsoon	4.4	62.5	0.38	8.64	0.0018
July		4.6	65.4	0.40	8.70	0.0016
August		5.0	70.6	0.41	8.20	0.0014
September		4.8	68.2	0.45	9.38	0.0015
October		Retreating Monsoon	4.2	60.4	0.43	10.24
November	3.8		54.2	0.36	9.47	0.0024

**CHART NO. 3      SHOWING GONADO SOMATIC RATIO OF *M. assamensis*  
(Male)**

Months & Seasons		Weight of <i>M. assamensis</i> (Av.)	Length of <i>M. assamensis</i> (Av.)	Weight of Gonad (Av.)	GSR	K-Factor
December	Winter	1.72-5.50 3.6	28.2-70.4 49.3	0.20	5.56	0.0030
January		1.70-5.42 3.6	26.8-70.4 48.6	0.18	5.00	0.0031
February		1.67-5.22 3.4	24.6-69.8 47.2	0.12	3.52	0.0032
March	Pre Monsoon	1.62-5.36 3.5	22.4-68.5 45.5	0.09	2.57	0.0037
April		1.56-5.25 3.4	20.8-70.2 45.5	0.13	3.82	0.0036
May		1.68-5.42 3.6	25.2-70.4 47.8	0.18	5.0	0.0033
June	Monsoon	1.62-5.28 3.5	22.4-74.8 48.6	0.20	5.71	0.0030
July		1.70-5.36 3.5	24.4-78.6 51.5	0.22	6.29	0.0026
August		1.68-5.24 3.6	24.8-72.6 48.7	0.25	6.94	0.0031
September		1.66-5.22 3.8	23.5-71.8 47.7	0.26	6.84	0.0035
October	Retreating Monsoon	1.64-5.32 3.7	24.4-70.6 47.5	0.24	6.48	0.0035
November		1.85-5.30 3.7	31.5-70.3 50.9	0.23	6.22	0.0026

**CHART NO. 4      SHOWING GONADO SOMATIC RATIO OF *M. assamensis*  
(Female)**

Months & Seasons		Weight of <i>M. assamensis</i> (Av.)	Length of <i>M. assamensis</i> (Av.)	Weight of Gonad (Av.)	GSR	K-Factor
December	Winter	1.72-5.50 4.1	28.2-70.4 48.5	0.30	7.32	0.0035
January		1.70-5.42 3.8	26.8-70.4 46.5	0.27	7.11	0.0038
February		1.67-5.22 4.0	24.6-69.8 47.0	0.24	6.00	0.0031
March	Pre Monsoon	1.62-5.36 4.3	22.4-68.5 44.5	0.21	4.88	0.0040
April		1.56-5.25 4.6	20.8-70.2 43.8	0.25	5.43	0.0034
May		1.68-5.42 4.2	25.2-70.4 46.4	0.28	6.67	0.0042
June	Monsoon	1.62-5.28 3.9	22.4-74.8 50.2	0.33	8.46	0.0031
July		1.70-5.36 3.7	24.4-78.6 51.3	0.35	9.46	0.0027
August		1.68-5.24 4.1	24.8-72.6 47.2	0.38	9.27	0.0036
September		1.66-5.22 4.4	23.5-71.8 45.8	0.40	9.09	0.0027
October	Retreating Monsoon	1.64-5.32 4.5	24.4-70.6 46.4	0.37	8.22	0.0046
November		1.85-5.30 4.2	31.5-70.3 48.5	0.33	7.86	0.0037

**CHART NO. 5 SHOWING GONADO SOMATIC RATIO OF  
*M. malcolmsonii* (Male)**

Months & Seasons		Weight of <i>M. malcolmsonii</i> (Av.)	Length of <i>M. malcolmsonii</i> (Av.)	Weight of Gonad (Av.)	GSR	K-Factor
December	Winter	30.2-40.4 35.3	71.8-138.6 104.9	1.84	5.21	0.0031
January		30.8-38.6 34.7	70.6-136.3 103.5	1.88	5.42	0.0031
February		29.8-35.4 32.6	68.3-127.1 97.7	1.98	6.07	0.0034
March	Pre Monsoon	28.2-34.4 31.3	62.4-126.2 94.3	2.10	6.70	0.0037
April		30.5-36.8 33.5	70.6-130.5 100.6	2.16	6.44	0.0033
May		23.1-36.4 29.8	74.2-132.5 103.4	2.24	7.52	0.0027
June	Monsoon	22.5-47.1 34.8	72.1-158.4 115.3	2.06	5.92	0.0023
July		25.2-46.4 35.8	76.1-156.2 116.2	1.97	5.50	0.0022
August		30.0-48.5 39.3	70.11-162.0 116.5	1.84	4.68	0.0025
September		24.2-46.8 35.5	78.4-160.5 119.5	1.72	4.85	0.0022
October	Retreating Monsoon	25.3-42.8 34.1	76.1-156.2 116.1	1.68	4.92	0.0022
November		30.5-40.8 35.7	72.2-140.1 106.2	1.76	4.93	0.0030

**CHART NO. 6 SHOWING GONADO SOMATIC RATIO OF  
*M. malcolmsonii* (Female)**

Months & Seasons		Weight of <i>M. malcolmsonii</i> (Av.)	Length of <i>M. malcolmsonii</i> (Av.)	Weight of Gonad (Av.)	GSR	K-Factor
December	Winter	33.2	106.4	2.08	6.27	0.0030
January		34.3	102.6	2.28	6.65	0.0031
February		35.6	98.5	3.68	10.33	0.0035
March	Pre Monsoon	40.8	96.4	4.82	11.81	0.0037
April		42.6	108.6	4.96	11.6	0.0033
May		48.3	102.4	3.76	7.78	0.0045
June	Monsoon	52.4	112.7	3.04	5.80	0.0037
July		40.2	121.3	2.70	6.71	0.0022
August		38.6	118.5	2.84	6.42	0.0023
September		36.7	116.3	2.21	6.02	0.0023
October	Retreating Monsoon	35.4	115.8	2.10	5.93	0.0023
November		32.3	110.5	1.98	6.13	0.0024

**CHART NO. 7      SHOWING GONADO SOMATIC RATIO OF *M. brimanicum choprae* (Male)**

Months & Seasons		Weight of <i>M. brimanicum choprae</i> (Av.)	Length of <i>M. brimanicum choprae</i> (Av.)	Weight of Gonad (Av.)	GSR	K-Factor
December	Winter	27.3-55.8 41.6	70.2-168.4 125.6	1.87	4.50	0.0021
January		30.5-50.2 43.0	72.4-152.8 119.3	1.92	4.47	0.0025
February		27.2-40.8 40.4	68.3-136.5 112.6	2.02	5.00	0.0028
March	Pre Monsoon	27.4-48.6 34.0	72.8-148.5 102.4	2.08	6.12	0.0032
April		28.8-42.5 38.0	80-144.2 110.7	2.15	5.66	0.0028
May		30.4-51.3 35.7	88.6-170.4 112.1	2.10	5.88	0.0025
June	Monsoon	34.2-52.4 40.6	92.4-172.3 129.5	2.05	5.05	0.0019
July		36.4-55.6 43.3	105.4-176.2 132.4	2.0	4.62	0.0018
August		34.7-56.2 46.0	92.4-180.0 140.8	1.96	4.26	0.0016
September		27.4-52.3 45.5	76.4-170.6 136.2	1.90	4.18	0.0018
October	Retreating Monsoon	28.2-50.8 39.9	72.2-164.5 123.5	1.82	4.66	0.0021
November		27.3-55.8 39.5	78.6-172.5 118.4	1.76	4.46	0.0024

**CHART NO. 8      SHOWING GONADO SOMATIC RATIO OF *M. birmanicum choprae* (Female)**

Months & Seasons		Weight of <i>M. brimanicum choprae</i> (Av.)	Length of <i>M. brimanicum choprae</i> (Av.)	Weight of Gonad (Av.)	GSR	K-Factor
December	Winter	41.2	120.2	2.05	4.98	0.0039
January		45.2	115.6	3.32	7.35	0.0029
February		42.6	110.8	3.58	8.40	0.0031
March	Pre Monsoon	36.4	108.4	3.96	10.88	0.0029
April		40.2	112.6	3.68	9.15	0.0028
May		48.4	118.5	3.60	7.44	0.0029
June	Monsoon	52.8	127.4	2.72	5.15	0.0026
July		50.4	136.5	2.52	5.00	0.0020
August		49.5	142.1	2.18	4.40	0.0017
September		44.3	137.3	1.92	4.33	0.0017
October	Retreating Monsoon	42.8	122.5	1.74	4.07	0.0023
November		40.6	116.4	1.86	4.58	0.0026

**CHART NO. 9 SHOWING LENGTH – WEIGHT RELATIONSHIP OF  
*M. dayanum* IN DIFFERENT SEASONS AND HABITAT**

season	River		Beel		Pond		Swamp		Paddy field	
	Length (mm)	Weight (g)	Length (mm)	Weight (g)	Length (mm)	Weight (g)	Length (mm)	Weight (g)	Length (mm)	Weight (g)
Pre Monsoon	44.4 – 65.2	1.82 – 5.08	53 – 68	2.24 – 5.20	50.2 – 64.0	2.16 – 5.10	32.4 – 68.2	1.72 – 5.08	30.2 – 60.5	1.56 – 4.82
Monsoon	52.4 – 88.6	2.08 – 5.42	48.2 – 93.0	1.96 – 5.72	42.6 – 84.5	1.92 – 5.68	42.8 – 80.6	1.96 – 5.02	32.8 – 68.6	1.70 – 5.12
Retreating Monsoon	38.1 – 78.4	1.78 – 5.08	38.5 – 76.2	1.82 – 5.02	40.1 – 88.2	1.92 – 5.64	36.4 – 86.6	1.72 – 5.62	31.2 – 64.6	1.60 – 4.98

**CHART NO. 10 SHOWING LENGTH – WEIGHT RELATIONSHIP OF *M. assamensis* IN DIFFERENT SEASONS AND HABITAT.**

season	River		Beel		Pond		Swamp		Paddy field	
	Length (mm)	Weight (g)	Length (mm)	Weight (g)	Length (mm)	Weight (g)	Length (mm)	Weight (g)	Length (mm)	Weight (g)
Pre Monsoon	31.8 – 70.2	1.80 – 5.25	32.4 – 70.4	1.84 – 5.42	30.8 – 68.4	1.80 – 5.36	25.2 – 62.4	1.68 – 4.86	20.8 – 58.5	1.56 – 4.72
Monsoon	30.6 – 74.8	1.78 – 5.28	28.5 – 78.6	1.72 – 5.36	30.2 – 72.6	1.82 – 5.24	24.5 – 68.2	1.64 – 5.18	22.4 – 60.5	1.62 – 5.12
Retreating Monsoon	31.5 – 70.3	1.85 – 5.30	32.4 – 74.2	1.96 – 6.20	32.8 – 70.6	2.08 – 5.32	30.6 – 65.2	1.82 – 4.96	24.4 – 58.8	1.70 – 4.86

**CHART NO. 11 TABLE SHOWING LENGTH –  
WEIGHT RELATIONSHIP OF *M. birmanicum  
choprae* AND *M. malcolmsonii* IN DIFFERENT  
SEASONS AND HABITAT.**

season	<i>M. birmanicum choprae</i>				<i>M. malcolmsonii</i>			
	River		Beel		River		Beel	
	Length (mm)	Weight (g)	Length (mm)	Weight (g)	Length (mm)	Weight (g)	Length (mm)	Weight (g)
Pre Monsoon	80 – 144.2	4.1 – 22.73	68.3 – 136.5	3.6 – 20.80	74.2 – 132.5	23.1 – 36.4	62.4 – 126.2	28.2 – 34.4
Monsoon	105.4 – 180.0	8.1 – 31.8	92.4 – 176.2	7.6 – 31.0	78.4 – 162.0	24.2 – 48.5	70.4 – 138.0	30.0 – 42.2
Retreating Monsoon	76.4 – 170.6	3.9 – 28.6	72.2 – 164.5	3.8 – 27.4	76.1 – 156.2	25.3 – 42.8	72.2 – 140.1	30.5 – 40.8

**CHART NO. 12 CHART SHOWING THE ELEMENTS CU, ZN & FE  
PRESENT IN  $\mu$  G/ML IN CARAPACE AND  
MUSCLES OF *M. birmanicum choprae*, *M.  
malcolmsonii*, *M. dayanum* and *M. assamensis*.**

Name of Species	Cu ( $\mu$ g/ml)		Zn ( $\mu$ g/ml)		Fe ( $\mu$ g/ml)	
	Carapace	Muscles	Carapace	Muscles	Carapace	Muscles
<i>M. birmanicum choprae</i>	0.170 – 0.223	0.018 – 0.020	0.685 – 0.736	0.067 – 0.099	0.217 – 0.229	0.177 – 0.237
<i>M. malcolmsonii</i>	0.148 – 0.218	0.016 – 0.020	0.624 – 0.720	0.062 – 0.094	0.205 – 0.218	0.156 – 0.224
<i>M. dayanum</i>	0.218 – 0.332	0.036 – 0.048	0.076 – 0.204	0.086 – 0.092	0.224 – 0.235	0.168 – 0.242
<i>M. assamensis</i>	0.198 – 0.307	0.021 – 0.023	0.067 – 0.192	0.067 – 0.069	0.255 – 0.270	0.298 – 0.306