APPENDIX

TABULATED STATEMENTS SHOWING IN DETAIL THE GILL-SURFACE PER UNIT VOLUME CALCULATED IN DIFFERENT FISHES EXAMINED

1. Water-breathing fishes

1. Callichrous malabaricus (Cuv.)

HABITAT : Fresh-water.

VOLUME : 6.5 cc.

NO. OF GILLS : 4 pairs.

GILL-SURFACE PER UNIT VOLUME : 152.8 sq.mm.

Particulars of the gill filaments.	No. of gill filaments	Average length of g.f. in mm. L	Average breadth of g.f. in mm. B	Area on one side of g.f. in sq.mm. L x B	Total area of g.f. in sq.mm. 2L x B	Total area in sq.mm.
Gill filaments of all the gills						
Anterior set						
□r portion	8x8x2	1.1	0.150	0.165	0.33	42.24
△r portion	8x8x2	0.3	0.100	0.030	0.06	3.84
Middle set						
□r portion	70x8x2	1.6	0.225	0.360	0.72	806.40
△r portion	70x8x2	0.5	0.200	0.050	0.10	112.00
Posterior set						
□r portion	5x8x2	1.1	0.150	0.165	0.33	26.40
△r portion	5x8x2	0.3	0.100	0.030	0.06	2.40
Total respiratory area						993.28 sq.mm.

N.B. :- 1. The gill-filaments were triangular at the tips, while the rest of the surface was rectangular.

2. For triangular portions : L = Altitude, LxB = $\frac{1}{2}$Altitude x Base.

2. Callichrous pabda (Ham.)

HABITAT : Fresh-water.

VOLUME : 54.6 cc.

NO. OF GILLS : 4 pairs.

GILL-SURFACE PER UNIT VOLUME : 148.0 sq.mm.

Particulars of the gill filaments.	No.of the gill-filaments	Average length of g.f. in mm. L	Average breadth of g.f. in mm. B	Area on one side of the g.f. in sq.mm. L x B	Total area of the g.f. in sq.mm. 2L x B	Total area in sq.mm.
Gill filaments of all the gills.						
Anterior set	12x8x2	3.7	0.3	1.11	2.22	426.24
Middle set	44x8x2	6.8	0.7	4.76	9.52	6702.08
Posterior set	27x8x2	3.6	0.3	1.08	2.16	933.12
Total respiratory area						8061.44 sq.mm.

3. Arius dussumieri (Cuv. & Val.)

HABITAT : Marine.

VOLUME : 7.0 cc.

NO. OF GILLS : 4 pairs.

GILL-SURFACE PER UNIT VOLUME : 165.9 sq.mm.

Particulars of the gill filaments.	No.of the gill-filaments	Average length of g.f. in mm. L	Average breadth of g.f. in mm. B	Area on one side of the g.f. in sq.mm. L x B	Total area of the g.f. in sq.mm. 2L x B	Total area in sq.mm.
Gill filaments on the first and second pairs of gills						
Anterior set	16x4x2	1.5	0.2	0.30	0.6	76.8
Middle set	48x4x2	2.5	0.3	0.75	1.5	576.0
Posterior set	10x4x2	1.5	0.2	0.30	0.6	48.0
Gill filaments on the third and fourth pairs of gills						
Anterior set	14x4x2	1.00	0.15	0.15	0.3	33.6
Middle set	42x4x2	2.00	0.30	0.60	1.2	403.2
Posterior set	10x4x2	1.00	0.15	0.15	0.3	24.0
Total respiratory area ..... 1161.6 sq.mm.						

4. Barbus vittatus (Day)

HABITAT : Fresh-water.

VOLUME : 1.0 cc.

NO. OF GILLS : 4 pairs.

GILL-SURFACE PER UNIT VOLUME: : 153.6 sq.mm.

Particulars of the gill filaments.	No.of the gill-filaments	Average length of g.f. in mm. L	Average breadth of g.f. in mm. B	Area on one side of the g.f. in sq.mm. L x B	Total area of the g.f. in sq.mm. 2L x B	Total area in sq.mm.
Gill filaments on the first pair of gills	36x2x2	1.0	0.15	0.15	0.3	43.2
Gill filaments on the second and third pair of gills	32x4x2	1.0	0.15	0.15	0.3	76.8
Gill filaments on the fourth pair of gills	28x2x2	1.0	0.15	0.15	0.3	33.6
Total respiratory area ..... 153.6 sq.mm.						

5. Barbus dobsoni (Day)

HABITAT : Fresh-water.

VOLUME : 54.6 cc.

NO. OF GILLS : 4 pairs.

GILL-SURFACE PER UNIT VOLUME : 137.19 sq.mm.

Particulars of the gill filaments.	No.of the gill-filaments	Average length of g.f. in mm. L	Average breadth of the g.f. in mm. B	Area on one side of the g.f. in sq.mm. L x B	Total area of g.f.in sq.mm. 2L x B	Total area in sq.mm.
Gill filaments on the first, second and third pair of gills						
Anterior set	17x6x2	3.7	0.30	1.110	2.22	319.68
Middle set	44x6x2	6.8	0.70	4.760	9.52	5026.56
Posterior set	27x6x2	3.6	0.30	1.080	2.16	699.84
Gill filaments on the fourth pair of gills						
Anterior set	18x2x2	3.2	0.30	0.960	1.92	138.24
Middle set	33x2x2	6.1	0.70	4.270	8.54	1127.28
Posterior set	29x2x2	3.1	0.25	0.775	1.55	179.80
Total respiratory area ..... 7491.4 sq.mm.						

6. Barilius evazardi (Day)

HABITAT : Fresh-water.

VOLUME : 4.5 cc.

NO. OF GILLS : 4 pairs.

GILL-SURFACE PER UNIT VOLUME : 153.3 sq.mm.

Particulars of the gill filaments.	No. of gill filaments	Average length of g.f. in mm. L	Average breadth of g.f. in mm. B	Area on one side of g.f. in sq.mm. L x B	Total area of g.f. in sq.mm. 2L x B	Total area in sq.mm.
Gill filaments of the first and second pairs of gills						
Anterior set	7x4x2	1.6	0.12	0.192	0.384	21.504
Middle set	48x4x2	2.3	0.18	0.414	0.828	317.952
Posterior set	4x4x2	1.6	0.12	0.192	0.384	12.288
Gill filaments of third and fourth pairs of gills						
Anterior set	7x4x2	1.6	0.12	0.192	0.384	21.504
Middle set	46x4x2	2.3	0.18	0.414	0.828	304.704
Posterior set	4x4x2	1.6	0.12	0.192	0.384	12.288
Total respiratory area ..... 690.24 sq.mm.						

7. Rasbora daniconius (Ham.)

HABITAT : Fresh-water.

VOLUME : 9.5 cc.

NO. OF GILLS : 4 pairs.

GILL-SURFACE PER UNIT VOLUME : 140.3 sq.mm.

Particulars of the gill filaments.	No. of gill filaments	Average length of g.f. in mm. L	Average breadth of g.f. in mm. B	Area on one side of g.f. in sq.mm. L x B	Total area of g.f.in sq.mm. 2L x B	Total area in sq.mm.
Gill filaments of the first pair of gills	64x2x2	2.24	0.3	0.672	1.344	344.06
Gill filaments of the second and third pairs of gills	62x4x2	2.24	0.3	0.672	1.344	666.62
Gill filaments of the fourth pair of gills	60x2x2	2.24	0.3	0.672	1.344	322.56
Total respiratory area ..... 1333.24 sq.mm.						

8. Cirrhina fulungee (Sykes)

HABITAT : Fresh-water.

VOLUME : 13.5 cc.

NO. OF GILLS : 4 pairs.

GILL-SURFACE PER UNIT VOLUME : 163.8 sq.mm.

Particulars of the gill filaments.	No. of gill filaments	Average length of g.f. in mm. L	Average breadth of g.f. in mm. B	Area on one side of g.f. in sq.mm. L x B	Total area of g.f. in sq.mm. 2L x B	Total area in sq.mm.
All the gill filaments						
□r portion						
Anterior set	3x8x2	1.0	0.5	0.50	1.00	48.0
Middle set	48x8x2	2.3	0.5	1.15	2.30	1766.4
Posterior set	2x8x2	1.0	0.5	0.50	1.00	32.0
△r portion						
Anterior set	3x8x2	0.5	0.5	0.125	0.125	12.0
Middle set	48x8x2	0.9	0.5	0.225	0.450	345.6
Posterior set	2x8x2	0.5	0.5	0.125	0.250	8.0
Total respiratory area ..... 2212.0 sq.mm.						

N.B. :- 1. The gill filaments were triangular at the tips, while the rest of the surface was rectangular.
2. For triangular portions, L = Altitude, LxB = ½ Altitude x base.

9. Aspidoparia morar (Ham.)

HABITAT : Fresh-water.

VOLUME : 6.0 cc.

NO. OF GILLS : 4 pairs.

GILL-SURFACE PER UNIT VOLUME : 144.96 sq.mm.

Particulars of the gill filaments.	No. of gill filaments	Average length of g.f. in mm. L	Average breadth of g.f. in mm. B	Area on one side of g.f. in sq.mm. L x B	Total area of g.f.in sq.mm. 2L x B	Total area in sq.mm.
Gill filaments of all the gills						
Anterior set	17x8x2	0.8	0.3	0.24	0.48	130.56
Middle set	42x8x2	1.7	0.3	0.51	1.02	685.44
Posterior set	7x8x2	0.8	0.3	0.24	0.48	53.76
Total respiratory area ..... 869.76 sq.mm.						

10. Rohtee ogilbii (Sykes)

HABITAT : Fresh-water.

VOLUME : 28.0 cc.

NO. OF GILLS : 4 pairs.

GILL-SURFACE PER UNIT VOLUME : 139.8 sq.mm.

Particulars of the gill filaments.	No. of gill filaments	Average length of g.f. in mm. L	Average breadth of g.f. in mm. B	Area on one side of g.f. in sq.mm. L x B	Total area of g.f. in sq.mm. 2L x B	Total area in sq.mm.
Gill filaments of the first and second pairs of gills	68x4x2	4.6	0.4	1.84	3.68	2001.92
Gill filaments of the third and fourth pairs of gills	65x4x2	4.6	0.4	1.84	3.68	1913.60
Total respiratory area ..... 3915.52 sq.mm.						

11. Coilèa dussumieri (Cuv. & Val.)

HABITAT : Marine.

VOLUME : 8.5 cc.

NO. OF GILLS : 4 pairs.

GILL-SURFACE PER UNIT VOLUME : 153.2 sq.mm.

Particulars of the gill filaments.	No. of gill filaments	Average length of g.f. in mm. L	Average breadth of g.f. in mm. B	Area on one side of g.f. in sq.mm. L x B	Total area of g.f. in sq.mm. 2L x B	Total area in sq.mm.
Gill filaments of the first and second pairs of gills						
Anterior set	15x4x2	1.15	0.25	0.2875	0.575	69.00
Middle set	64x4x2	2.10	0.30	0.6300	1.260	645.12
Posterior set	7x4x2	1.15	0.25	0.2875	0.575	32.20
Gill filaments of the third and fourth pairs of gills						
Anterior set	9x4x2	1.0	0.25	0.25	0.50	36.00
Middle set	52x4x2	2.0	0.30	0.60	1.20	499.20
Posterior set	5x4x2	1.0	0.25	0.25	0.50	20.00
Total respiratory area ..... 1301.52 sq.mm.						

12. Clupea sindensis (Cuv. & Val.)

HABITAT : Marine.

VOLUME : 14.0 cc.

NO. OF GILLS : 4 pairs.

GILL-SURFACE PER UNIT VOLUME : 144.0 sq.mm.

Particulars of the gill filaments.	No. of gill filaments	Average length of g.f. in mm. L	Average breadth of g.f. in mm. B	Area on one side of g.f. in sq.mm. L x B	Total area of g.f. in sq.mm. 2L x B	Total area in sq.mm.
Gill filaments of all the gills						
$\square^{r}$ portion	70x8x2	2.8	0.3	0.84	1.68	1881.6
Δ^{r} portion	70x8x2	0.4	0.3	0.06	0.12	134.4
Total respiratory area ..... 2016.0 sq.mm.						

N.B. :- 1. The gill filaments were fairly triangular at the tips, while the rest of the surface was rectangular.
2. For triangular portions L = Altitude, LB = $\frac{1}{2}$ Altitude x base.

13. Clupea fimbriata (Cuv. & Val.)

HABITAT : Marine.

VOLUME : 49.0 cc.

NO. OF GILLS : 4 pairs.

GILL-SURFACE PER UNIT VOLUME : 150.5 sq.mm.

Particulars of the gill filaments.	No. of gill filaments	Average length of g.f. in mm. L	Average breadth of g.f. in mm. B	Area on one side of g.f. in sq.mm. L x B	Total area of g.f. in sq.mm. 2L x B	Total area in sq.mm.
Gill filaments of the first, second and third pairs of gills						
First set	2x6x2	4.00	0.55	2.2000	4.400	105.60
Second set	19x6x2	6.55	0.55	3.6025	7.205	1642.74
Third set	49x6x2	6.00	0.55	3.3000	6.600	3880.80
Fourth set	5x6x2	4.00	0.55	2.2000	4.400	264.00
Gill filaments of the fourth pair of gills						
Anterior set	3x2x2	4.0	0.55	2.20	4.4	52.80
Middle set	68x2x2	5.0	0.55	2.50	5.0	1360.00
Posterior set	4x2x2	4.0	0.55	2.20	4.4	70.40
Total respiratory area ..... 7376.34 sq.mm.						

14. Engraulis mystax (Bl.Schn.)

HABITAT : Marine.

VOLUME : 37.0 cc.

NO. OF GILLS : 4 pairs.

GILL-SURFACE PER UNIT VOLUME : 147.6 sq.mm.

Particulars of the gill filaments.	No. of gill filaments	Average length of g.f. in mm. L	Average breadth of g.f. in mm. B	Area on one side of g.f. in sq.mm. L x B	Total area of g.f. in sq.mm. 2L x B	Total area in sq.mm.
Gill filaments of the first pair of gills						
Anterior set	4x2x2	2.5	0.40	1.00	2.00	32.00
∩Middle set						
□r portion	97x2x2	3.6	0.45	1.62	3.24	1257.12
△r portion	97x2x2	0.6	0.30	0.09	0.18	69.84
Posterior set	17x2x2	2.5	0.40	1.00	2.00	136.00
Gill filaments of the second pair of gills						
Anterior set	4x2x2	2.5	0.40	1.00	2.00	32.00
Middle set						
□r portion	91x2x2	3.6	0.45	1.62	3.24	1179.36
△r portion	91x2x2	0.6	0.30	0.09	0.18	65.52
Posterior set	17x2x2	2.5	0.40	1.00	2.00	136.00
Gill filaments of the third pair of gills						
Anterior set	4x2x2	2.5	0.40	1.00	2.00	32.00
Middle set						
□r portion	88x2x2	3.6	0.45	1.62	3.24	1140.00
□r portion	88x2x2	0.6	0.30	0.09	0.18	63.36
Posterior set	17x2x2	2.5	0.40	1.00	2.00	136.00
G.f.of fourth pair						
Anterior set	3x2x2	2.5	0.40	1.00	2.00	24.00
Middle set						
□r portion	85x2x2	3.6	0.45	1.62	3.24	1101.60
△r portion	85x2x2	0.6	0.30	0.09	0.18	61.20
Posterior set	5x2x2	2.5	0.40	1.00	2.00	40.00
Total respiratory area						5465.48 sq.mm.

15. Saurida nedulosa (Cuv. & Val.)

HABITAT : Marine.

VOLUME : 61.0 cc.

NO. OF GILLS : 4 pairs.

GILL-SURFACE PER UNIT VOLUME : 148.3 sq.mm.

Particulars of the gill filaments.	No. of gill filaments	Average length of g.f. in mm. L	Average breadth of g.f. in mm. B	Area on one side of g.f. in sq.mm. L x B	Total area of g.f. in sq.mm. 2L x B	Total area in sq.mm.
Gill filaments of the first and second pairs of gills						
Anterior set	15x4x2	2.9	0.4	1.16	2.32	278.40
Middle set	107x4x2	6.0	0.4	2.40	4.80	4108.80
Posterior set	28x4x2	2.9	0.4	1.16	2.32	519.68
Gill filaments of the third pair of gills						
Anterior set	15x2x2	2.9	0.4	1.16	2.32	139.20
Middle set	95x2x2	6.0	0.4	2.40	4.80	1824.00
Posterior set	20x2x2	2.9	0.4	1.16	2.32	185.60
Gill filaments of the fourth pair of gills						
Anterior set	18x2x2	2.9	0.4	1.16	2.32	167.04
Middle set	87x2x2	6.0	0.4	2.40	4.80	1670.40
Posterior set	22x2x2	2.9	0.4	1.16	2.32	204.16
Total respiratory area ..... 9097.32 sq.mm.						

16. Gambusia affinis (Girrard)

HABITAT : Fresh-water.

VOLUME : 1.0 cc.

NO. OF GILLS : 4 pairs.

GILL-SURFACE PER UNIT VOLUME : 148.8 sq.mm.

Particulars of the gill filaments.	No. of gill filaments	Average length of g.f. in mm. L	Average breadth of g.f. in mm. B	Area on one side of g.f. in sq.mm. L x B	Total area of g.f. in sq.mm. 2L x B	Total area in sq.mm.
Gill filaments of all the gills						
Anterior set	4x8x2	0.15	0.15	0.175	0.150	9.60
Middle set	20x8x2	1.30	0.15	0.195	0.390	124.80
Posterior set	6x8x2	0.50	0.15	0.075	0.150	14.40
Total respiratory area ..... 148.80 sq.mm.						

17. Belone cancila (Cuv. & Val.)

HABITAT : Fresh-water.

VOLUME : 17.5 cc.

NO. OF GILLS : 4 pairs.

GILL-SURFACE PER UNIT VOLUME : 140.9 sq.mm.

Particulars of the gill filaments.	No. of gill filaments	Average length of g.f. in mm. L	Average breadth of g.f. in mm. B	Area on one side of g.f. in sq.mm. L x B	Total area of g.f. in sq.mm. 2L x B	Total area in sq.mm.
Gill filaments of the first and second pairs of gills						
Anterior set	14x4x2	0.75	0.1	0.075	0.15	16.80
Middle set	67x4x2	0.29	0.4	1.160	2.32	1243.52
Posterior set	16x4x2	1.40	0.1	0.140	0.28	35.84
Gill filaments of the third and fourth pairs of gills						
Anterior set	10x4x2	0.75	0.1	0.075	0.15	12.00
Middle set	61x4x2	2.90	0.4	1.160	2.32	1132.16
Posterior set	12x4x2	1.40	0.1	0.140	0.28	26.88
Total respiratory area ..... 2467.2 sq.mm.						

18. Serranus fasciatus (Day)

HABITAT : Marine.

VOLUME : 6.5 cc.

NO. OF GILLS : 4 pairs.

GILL-SURFACE PER UNIT VOLUME : 165.8 sq.mm.

Particulars of the gill filaments.	No. of gill filaments	Average length of g.f. in mm. L	Average breadth of g.f. in mm. B	Area on one side of g.f. in sq.mm. L x B	Total area of g.f. in sq.mm. 2L x B	Total area in sq.mm.
Gill filaments of the first pair of gills						
Anterior set	4x2x2	0.50	0.1	0.05	0.1	1.6
Middle set	74x2x2	2.75	0.2	0.55	1.1	325.6
Posterior set	7x2x2	0.50	0.1	0.05	0.1	2.8
Gill filaments of the second pair of gills						
Anterior set	4x2x2	0.50	0.1	0.05	0.1	1.6
Middle set	70x2x2	2.75	0.2	0.55	1.1	308.0
Posterior set	5x2x2	0.50	0.1	0.05	0.1	2.0
Gill filaments of the third pair of gills						
Anterior set	3x2x2	0.5	0.1	0.05	0.10	1.2
Middle set	60x2x2	2.6	0.2	0.52	1.04	249.6
Posterior set	5x2x2	0.5	0.1	0.05	0.10	2.0
Gill filaments of the fourth pair of gills						
Anterior set	4x2x2	0.5	0.1	0.05	0.10	1.60
Middle set	43x2x2	2.6	0.2	0.52	1.04	178.88
Posterior set	6x2x2	0.5	0.1	0.05	0.10	2.40
Total respiratory area ..... 1077.28 sq.mm.						

19. Lutjanus caeruliolineatus (Day)

HABITAT : Marine.

VOLUME : 40.5 cc.

NO. OF GILLS : 4 pairs.

GILL-SURFACE PER UNIT VOLUME : 150.4 sq.mm.

Particulars of the gill filaments.	No. of gill filaments	Average length of g.f. in mm. L	Average breadth of g.f. in mm. B	Area on one side of g.f. in sq.mm. L x B	Total area of g.f. in sq.mm. 2L x B	Total area in sq.mm.
Gill filaments of the first and second pairs of gills						
Anterior set	10x4x2	3.0	0.5	1.5	3.0	240.0
Middle set	68x4x2	4.8	0.5	2.4	4.8	2611.2
Posterior set	15x4x2	3.0	0.5	1.5	3.0	360.0
Gill filaments of the third and fourth pairs of gills						
Anterior set	12x4x2	3.0	0.5	1.50	3.0	288.0
Middle set	60x4x2	4.5	0.5	2.25	4.5	2160.0
Posterior set	18x4x2	3.0	0.5	1.50	3.0	432.0

Total respiratory area ..... 6091.2 sq.mm.

20. Therapon jarbua (Forsk.)

HABITAT : Marine.

VOLUME : 3.8 cc.

NO. OF GILLS : 4 pairs.

GILL-SURFACE PER UNIT VOLUME : 161.0 sq.mm.

Particulars of the gill filaments.	No. of gill filaments	Average length of g.f. in mm. L	Average breadth of g.f. in mm. B	Area on one side of g.f. in sq.mm. L x B	Total area of g.f. in sq.mm. 2L x B	Total area in sq.mm.
Gill filaments of all the gills						
Anterior set	8x8x2	1.1	0.15	0.165	0.33	42.24
Middle set	30x8x2	2.5	0.20	0.500	1.00	480.00
Posterior set	17x8x2	1.1	0.15	0.165	0.33	89.76
Total respiratory area ..... 612.0 sq.mm.						

21. Sciaena miles (Cuv. & Val.)

HABITAT : Marine.

VOLUME : 25.0 cc.

NO. OF GILLS : 4 pairs.

GILL-SURFACE PER UNIT VOLUME : 152.3 sq.mm.

particulars of the gill filaments.	No. of gill filaments	Average length of g.f. in mm. L	Average breadth of g.f. in mm. B	Area on one side of g.f. in sq.mm. L x B	Total area of g.f. in sq.mm. 2L x B	Total area in sq.mm.
Gill filaments of the first, second and third pairs of gills						
Anterior set	15x6x2	2.0	0.25	0.50	1.00	180.0
Middle set	75x6x2	3.9	0.40	1.56	3.12	2808.0
Posterior set	17x6x2	2.0	0.25	0.50	1.00	204.0
Gill filaments of the fourth pair of gills						
Anterior set	13x2x2	2.00	0.25	0.500	1.00	52.0
Middle set	70x2x2	2.95	0.30	0.885	1.77	495.6
Posterior set	17x2x2	2.00	0.25	0.500	1.00	68.0
Total respiratory area ..... 3807.6 sq.mm.						

22. Sciaena ossea (Day)

HABITAT : Marine.

VOLUME : 60.0 cc.

NO. OF GILLS : 4 pairs.

GILL-SURFACE PER UNIT VOLUME : 135.9 sq.mm.

Particulars of the gill filaments.	No. of gill filaments	Average length of g.f. in mm. L	Average breadth of g.f. in mm. B	Area on one side of g.f. in sq.mm. L x B	Total area of g.f. in sq.mm. 2L x B	Total area in sq.mm.
Gill filaments of the first pair of gills						
Anterior set	3x2x2	3.0	0.35	1.05	2.1	25.2
Middle set	130x2x2	5.0	0.40	2.00	4.0	2080.0
Posterior set	7x2x2	3.0	0.35	1.05	2.1	58.8
Gill filaments of the second pair of gills						
Anterior set	4x2x2	3.0	0.35	1.05	2.1	33.6
Middle set	125x2x2	5.0	0.40	2.00	4.0	2000.0
Posterior set	6x2x2	3.0	0.35	1.05	2.1	50.4
Gill filaments of the third pair of gills						
Anterior set	4x2x2	3.0	0.35	1.05	2.1	33.6
Middle set	120x2x2	5.0	0.40	2.00	4.0	1920.0
Posterior set	5x2x2	3.0	0.35	1.05	2.1	42.0
Gill filaments of the fourth pair of gills						
Anterior set	5x2x2	3.0	0.35	1.05	2.1	42.0
Middle set	115x2x2	5.0	0.40	2.00	0.4	1840.0
Posterior set	4x2x2	3.0	0.35	1.05	2.1	33.6
Total respiratory area ..... 8159.2 sq.mm.						

23. Equula blochii (Cuv. & Val.)

HABITAT : Marine.

VOLUME : 6.0 cc.

NO. OF GILLS : 4 pairs.

GILL-SURFACE PER UNIT VOLUME : 155.6 sq.mm.

Particulars of the gill filaments.	No. of gill filaments	Average length of g.f. in mm. L	Average breadth of g.f. in mm. B	Area on one side of g.f. in sq.mm. L x B	Total area of g.f. in sq.mm. 2L x B	Total area in sq.mm.
Gill filaments of all the gills						
Anterior set						
$\square^r$ portion	10x8x2	2.0	0.150	0.300	0.60	96.0
$\triangle^r$ portion	10x8x2	1.0	0.150	0.075	0.15	24.0
Middle set						
$\square^r$ portion	30x8x2	2.4	0.225	0.540	1.08	518.4
$\triangle^r$ portion	30x8x2	1.2	0.200	0.120	0.24	115.2
Posterior set						
$\square^r$ portion	15x8x2	2.0	0.150	0.300	0.60	144.0
$\triangle^r$ portion	15x8x2	1.0	0.150	0.075	0.15	36.0
Total respiratory area ..... 933.6 sq.mm.						

N.B. :- 1. The gill filaments were fairly triangular at the tips, while the rest of the surface was rectangular.
2. For triangular portions : L = Altitude, LB = $\frac{1}{2}$ Altitude x base.

24. Equula daura (Cuv. & Val.)

HABITAT : Marine.

VOLUME : 5.5 cc.

NO. OF GILLS : 4 pairs.

GILL-SURFACE PER UNIT VOLUME : 152.3 sq.mm.

Particulars of the gill filaments.	No. of gill filaments	Average length of g.f. in mm. L	Average breadth of g.f. in mm. B	Area on one side of g.f. in sq.mm. L x B	Total area of g.f. in sq.mm. 2L x B	Total area in sq.mm.
Gill filaments of all the gills						
Anterior set						
□^{r} portion	12x8x2	2.0	0.15	0.300	0.60	115.2
△^{r} portion	12x8x2	1.0	0.15	0.075	0.15	28.8
Middle set						
□^{r} portion	28x8x2	2.3	0.20	0.460	0.92	412.4
△ portion	28x8x2	1.0	0.20	0.100	0.20	89.6
Posterior set						
□^{r} portion	16x8x2	2.0	0.15	0.300	0.60	153.6
△^{r} portion	16x8x2	1.0	0.15	0.075	0.15	38.4
Total respiratory area						838.0 sq.mm.

N.B. :- 1. The gill filaments were fairly triangular at the tips, while the rest-surface was rectangular.
2. For triangular portions: L = Altitude, LB = ½ Altitude x base.

25. Cybium guttatum (Bl-Schn.)

HABITAT : Marine.

VOLUME : 91.0 cc.

NO. OF GILLS : 4 pairs.

GILL-SURFACE PER UNIT VOLUME : 153.5 sq.mm.

Particulars of the gill filaments.	No. of gill filaments	Average length of g.f. in mm. L	Average breadth of g.f. in mm. B	Area on one side of g.f. in sq.mm. L x B	Total area of g.f. in sq.mm. 2L x B	Total area in sq.mm.
Gill filaments of the first, second and third pairs of gills						
Anterior set	16x6x2	2.70	0.40	1.0800	2.160	414.72
Middle set	142x6x2	6.25	0.45	2.8125	5.625	9585.00
Posterior set	20x6x2	2.70	0.40	1.0800	2.160	518.40
Gill filaments of the fourth pair of gills						
Anterior set	10x2x2	2.7	0.40	1.080	2.16	86.40
Middle set	150x2x2	6.0	0.45	2.700	5.14	3240.00
Posterior set	16x2x2	2.7	0.40	1.080	2.16	138.24
Total respiratory area						13982.76 sq.mm.

26. Stromateus cinerius (Bloch.)

HABITAT : Marine.

VOLUME : 147.0 cc.

NO. OF GILLS : 4 pairs.

GILL-SURFACE PER UNIT VOLUME : 150.0 sq.mm.

Particulars of the gill filaments.	No. of gill filaments	Average length of g.f. in mm. L	Average breadth of g.f. in mm. B	Area on one side of g.f. in sq.mm. L x B	Total area of g.f. in sq.mm. 2L x B	Total area in sq.mm.
Gill filaments of the first and second pairs of gills						
Anterior set	3x4x2	6.0	0.35	2.1	4.2	100.8
Middle set	87x4x2	12.0	0.75	9.0	18.0	12528.0
Posterior set	7x4x2	6.0	0.35	2.1	4.2	235.2
Gill filaments of the third pair of gills						
Anterior set	5x2x2	5.5	0.3	1.65	3.3	66.0
Middle set	80x2x2	11.0	0.7	7.70	15.4	4928.0
Posterior set	10x2x2	5.5	0.3	1.65	3.3	132.0
Gill filaments of the fourth pair of gills						
Anterior set	7x2x2	5.0	0.30	1.500	3.00	84.0
Middle set	70x2x2	10.5	0.65	6.825	13.65	3822.0
Posterior set	13x2x2	5.0	0.30	1.500	3.00	156.0
Total respiratory area ..... 22052.0 sq.mm.						

27. Stromateus niger (Bloch.)

HABITAT : Marine.

VOLUME : 32.0 cc.

NO. OF GILLS : 4 pairs.

GILL-SURFACE PER UNIT VOLUME : 161.0 sq.mm.

Particulars of the gill filaments.	No. of gill filaments	Average length of g.f. in mm. L	Average breadth of g.f. in mm. B	Area on one side of g.f. in sq.mm. L x B	Total area of g.f. in sq.mm. 2L x B	Total area in sq.mm.
G.f. of the first and second pairs of gills						
Anterior set						
□r portion	7x4x2	3.00	0.20	0.6000	1.200	67.2
△r portion	7x4x2	0.50	0.20	0.0500	0.100	5.6
Middle set						
□r portion	80x4x2	6.15	0.35	2.1525	4.305	2755.2
△r portion	80x4x2	0.80	0.35	0.1400	0.280	179.2
Posterior set						
□r portion	7x4x2	3.00	0.20	0.6000	1.200	67.2
△r portion	7x4x2	0.50	0.20	0.0500	0.100	5.6
G.f. of the third pair of gills						
Anterior set						
□r portion	8x2x2	3.0	0.2	0.60	1.20	38.40
△r portion	8x2x2	0.5	0.2	0.05	0.10	3.20
Middle set						
□r portion	72x2x2	5.6	0.3	1.68	3.36	967.68
△r portion	72x2x2	0.8	0.3	0.12	0.24	69.12
Posterior set						
□r portion	10x2x2	3.0	0.2	0.60	1.20	48.00
△r portion	10x2x2	0.5	0.2	0.05	0.10	4.00
G.f. of the fourth pair of gills						
Anterior set						
□r portion	6x2x2	3.0	0.2	0.600	1.20	28.8
△r portion	6x2x2	0.5	0.2	0.050	0.10	2.4
Middle set						
□r portion	65x2x2	5.0	0.3	1.500	3.00	780.0
△r portion	65x2x2	0.7	0.3	0.105	0.21	54.6
Posterior set						
□r portion	15x2x2	3.0	0.2	0.600	1.20	72.0
△r portion	15x2x2	0.5	0.2	0.050	0.10	6.0
Total respiratory area ..... 5134.2 sq.mm.						

N.B. :- 1. The gill filaments were fairly triangular at the tips, while the rest of the surface was rectangular.
2. For triangular portions : L = Altitude, LB = $\frac{1}{2}$ Altitude x base.

28. Sillago sihama (Gunther)

HABITAT : Marine.

VOLUME : 13.0 cc.

NO. OF GILLS : 4 pairs.

GILL-SURFACE PER UNIT VOLUME : 152.3 sq.mm.

Particulars of the gill filaments.	No. of gill filaments	Average length of g.f. in mm. L	Average breadth of g.f. in mm. B	Area on one side of g.f. in sq.mm. L x B	Total area of g.f. in sq.mm. 2L x B	Total area in sq.mm.
Gill filaments of the first pair of gills	97x2x2	2.5	0.275	0.6875	1.375	533.5
Gill filaments of the second and third pairs of gills	90x4x2	2.5	0.275	0.6875	1.375	990.0
Gill filaments of the fourth pair of gills	83x2x2	2.5	0.275	0.6875	1.375	456.5
Total respiratory area						1980.0 sq.mm.

29. Mugil borneensis (Blecker)

HABITAT : Marine.

VOLUME : 26.0 cc.

NO. OF GILLS : 4 pairs.

GILL-SURFACE PER UNIT VOLUME : 143.2 sq.mm.

Particulars of the gill filaments.	No. of gill filaments	Average length of g.f. in mm. L	Average breadth of g.f. in mm. B	Area on one side of g.f. in sq.mm. L x B	Total area of g.f. in sq.mm. 2L x B	Total area in sq.mm.
Gill filaments of the first, second and third pairs of gills						
Anterior set	11x6x2	2.0	0.4	0.80	1.60	211.20
Middle set	57x6x2	4.7	0.4	1.88	3.76	2571.84
Posterior set	15x6x2	2.0	0.4	0.80	1.60	288.00
Gill filaments of the fourth pair of gills	80x2x2	3.4	0.3	1.02	2.04	652.80
Total respiratory area ..... 3723.84 sq.mm.						

30. Mugil amarulus (Cuv. & Val.)

HABITAT : Marine.

VOLUME : 3.0 cc.

NO. OF GILLS : 4 pairs.

GILL-SURFACE PER UNIT VOLUME : 165.48 sq.mm.

Particulars of the gill filaments.	No. of gill filaments	Average length of g.f. in mm. L	Average breadth of g.f. in mm. B	Area on one side of g.f. in sq.mm. L x B	Total area of g.f. in sq.mm. 2L x B	Total area in sq.mm.
G.f. of the first and second pairs of gills						
Anterior set	3x4x2	0.5	0.1	0.05	0.10	2.40
Middle set						
□r portion	43x4x2	2.2	0.2	0.44	0.88	302.72
△r portion	43x4x2	0.2	0.2	0.02	0.04	13.76
Posterior set	6x4x2	0.5	0.1	0.05	0.10	4.80
G.f. of the third pair of gills						
Anterior set	3x2x2	0.50	0.1	0.05	0.10	1.2
Middle set						
□r portion	40x2x2	2.05	0.2	4.10	0.82	131.2
△r portion	40x2x2	0.20	0.2	0.02	0.04	6.4
Posterior set	4x2x2	0.50	0.1	0.05	0.10	1.6
G.f. of the fourth pair of gills						
Anterior set	4x2x2	0.5	0.10	0.05	0.1	1.6
Middle set	23x2x2	1.0	0.15	0.15	0.3	27.6
Posterior set	8x2x2	0.5	0.10	0.05	0.1	3.2
Total respiratory area ..... 496.48 sq.mm.						

N.B. :- 1. The middle set of gill filaments of the first, second and third pairs of gills were fairly triangular at the tips, while the rest of their surface was rectangular.

2. For triangular portions : L = Altitude, LB = ½ Altitude x base.

31. Mugil kelaarti (Geen.)

HABITAT : Marine.

VOLUME : 3.0 cc.

NO. OF GILLS : 4 pairs.

GILL-SURFACE PER UNIT VOLUME : 148.0 sq.mm.

Particulars of the gill filaments.	No. of gill filaments	Average length of g.f. in mm. L	Average breadth of g.f. in mm. B	Area on one side of g.f. in sq.mm. L x B	Total area of g.f. in sq.mm. 2L x B	Total area in sq.mm.
Gill filaments of the first, second and third pairs of gills						
Anterior set	11x6x2	0.6	0.15	0.09	0.18	23.76
Middle set						
□r portion	31x6x2	1.8	0.20	0.36	0.72	267.84
△r portion	31x6x2	0.5	0.20	0.05	0.10	37.20
Posterior set	17x6x2	0.6	0.15	0.09	0.18	36.72
Gill filaments of the fourth pair of gills						
Anterior set	15x2x2	0.6	0.15	0.09	0.18	10.80
Middle set	20x2x2	1.7	0.20	0.34	0.68	54.40
Posterior set	19x2x2	0.6	0.15	0.09	0.18	13.68
Total respiratory area						444.40 sq.mm.

N.B. :- 1. The middle set of gill filaments of the first, second and third pairs of gills were fairly triangular at the tips, while the rest of the surface was rectangular.
2. For triangular portions, L = Altitude, LxB = $\frac{1}{2}$ Altitude x Base.

32. Etroplus maculatus (Day)

HABITAT : Fresh-water.

VOLUME : 6.0 cc.

NO. OF GILLS : 4 pairs.

GILL-SURFACE PER UNIT VOLUME : 145.6 sq.mm.

Particulars of the gill filaments.	No. of gill filaments	Average length of g.f. in mm. L	Average breadth of g.f. in mm. B	Area on one side of g.f. in sq.mm. L x B	Total area of g.f. in sq.mm. 2L x B	Total area in sq.mm.
Gill filaments of all the gills	68x2x2	2.0	0.2	0.4	0.8	870.4
Total respiratory area						870.4 sq.mm.

33. Bregmaceros maclellandi (Thomson)

HABITAT : Marine.

VOLUME : 1.1 cc.

NO. OF GILLS : 4 pairs.

GILL-SURFACE PER UNIT VOLUME : 146.0 sq.mm.

Particulars of the gill filaments.	No. of gill filaments	Average length of g.f. in mm. L	Average breadth of g.f. in mm. B	Area on one side of g.f. in sq.mm. L x B	Total area of g.f.in sq.mm. 2L x B	Total area in sq.mm.
Gill filaments of the first, second and third pairs of gills						
Anterior set	3x6x2	0.4	0.10	0.040	0.080	2.88
Middle set	25x6x2	1.4	0.16	0.224	0.448	134.40
Posterior set	4x6x2	0.4	0.10	0.040	0.080	3.84
Gill filaments of the fourth pair of gills						
Anterior set	5x2x2	0.4	0.10	0.040	0.080	1.60
Middle set	10x2x2	1.2	0.16	0.192	0.384	15.36
Posterior set	8x2x2	0.4	0.10	0.040	0.080	2.56
Total respiratory area ..... 160.64 sq.mm.						

34. Plagusia bilineata (Bloch)

HABITAT : Marine.

VOLUME : 8.5 cc.

NO. OF GILLS : 4 pairs.

GILL-SURFACE PER UNIT VOLUME : 163.7 sq.mm.

Particulars of the gill filaments.	No. of gill filaments	Average length of g.f. in mm. L	Average breadth of g.f. in mm. B	Area on one side of g.f. in sq.mm. L x B	Total area of g.f. in sq.mm. 2L x B	Total area in sq.mm.
Gill filaments of the first and second pairs of gills	38x4x2	3.0	0.5	1.5	3.0	912.0
Gill filaments of the third and fourth pairs of gills	30x4x2	2.5	0.4	1.0	2.0	480.0
Total respiratory area						1392.0 sq.mm.

35. Triacanthus brevirostris (Temm. & Schleg.)

HABITAT : Marine.

VOLUME : 6.0 cc.

NO. OF GILLS : 4 pairs.

GILL-SURFACE PER UNIT VOLUME : 155.6 sq.mm.

Particulars of the gill filaments.	No. of gill filaments	Average length of g.f. in mm. L	Average breadth of g.f. in mm. B	Area on one side of g.f. in sq.mm. L x B	Total area of g.f. in sq.mm. 2L x B	Total area in sq.mm.
Gill filaments of the first pair of gills						
Longer g.f.	55x2x2	3.0	0.2	0.60	1.2	264.0
Shorter g.f.	4x2x2	1.5	0.1	0.15	0.3	4.8
Gill filaments of the second pair of gills						
Longer g.f.	49x2x2	3.0	0.2	0.60	1.2	235.2
Shorter g.f.	4x2x2	1.5	0.1	0.15	0.3	4.8
Gill filaments of the third pair of gills						
Longer g.f.	46x2x2	3.0	0.2	0.60	1.2	220.8
Shorter g.f.	5x2x2	1.5	0.1	0.15	0.3	6.0
Gill filaments of the fourth pair of gills						
Longer g.f.	40x2x2	3.0	0.2	0.60	1.2	192.0
Shorter g.f.	5x2x2	1.5	0.1	0.15	0.3	6.0
Total respiratory area						933.6 sq.mm.

36. Tetrodon fluviatilis (Ham.)

HABITAT : Marine.

VOLUME : 16.0 cc.

NO. OF GILLS : 3 pairs.

GILL-SURFACE PER UNIT VOLUME : 162.5 sq.mm.

Particulars of the gill filaments.	No. of gill filaments	Average length of g.f. in mm. L	Average breadth of g.f. in mm. B	Area on one side of g.f. in sq.mm. L x B	Total area of g.f. in sq.mm. 2L x B	Total area in sq.mm.
Gill filaments of all the gills						
Anterior set	2x6x2	1.8	0.50	0.9000	1.800	43.20
Middle set						
□r portion	48x6x2	3.6	0.55	1.9800	3.960	2280.96
△r portion	48x6x2	0.9	0.45	0.2025	0.405	233.28
Posterior set	2x6x2	1.8	0.50	0.9000	1.800	43.20
Total respiratory area					2600.64 sq.mm.	

N.B. :- 1. The gill filaments of the middle set were fairly triangular at the tips, while the rest of the surface was rectangular.
2. For triangular portions, L = Altitude, LxB = $\frac{1}{2}$ Altitude x Base.

37. Tetrodon patoca (Ham.)

HABITAT : Marine.

VOLUME : 273.0 cc.

NO. OF GILLS : 3 pairs.

GILL-SURFACE PER UNIT VOLUME : 132.7 sq.mm.

Particulars of the gill filaments.	No. of gill filaments	Average length of g.f. in mm. L	Average breadth of g.f. in mm. B	Area on one side of g.f. in sq.mm. L x B	Total area of g.f. in sq.mm. 2L x B	Total area in sq.mm.
Gill filaments of all the gills						
Anterior set						
□r portion	3x6x2	8.0	1.6	12.80	25.6	921.6
Δ portion	3x6x2	2.5	0.6	0.75	1.5	54.0
Middle set						
□r portion	70x6x2	12.0	1.6	19.20	38.4	32256.0
Δr portion	70x6x2	2.5	0.8	1.00	2.0	1680.0
Posterior set						
□r portion	4x6x2	8.0	1.6	12.80	25.6	1228.8
Δr portion	4x6x2	2.5	0.6	1.00	2.0	96.0
Total respiratory area						36236.4 sq.mm.

N.B. :- 1. The gill filaments were fairly triangular at the tips, while the rest of the surface was rectangular.
2. For triangular portions, L = Altitude, L x B = $\frac{1}{2}$ Altitude x Base.

2. Air-breathing fishes

A. 1-3 Occasional air-breathers

B. 4-14 Habitual air-breathers

1. Macrones gulio (Ham.)

HABITAT : Marine.

VOLUME : 37.0 cc.

NO. OF GILLS : 4 pairs.

GILL-SURFACE PER UNIT VOLUME : 148.68 sq.mm.

Particulars of the gill filaments.	No. of gill filaments	Average length of g.f. in mm. L	Average breadth of g.f. in mm. B	Area on one side of g.f. in sq.mm. L x B	Total area of g.f. in sq.mm. 2L x B	Total area in sq.mm.
Gill filaments of the first, second and third pairs of gills						
Anterior set						
$\square^r$ portion	18x6x2	2.0	0.7	1.400	2.80	604.80
Δ^r portion	18x6x2	1.2	0.7	0.420	0.84	181.44
Middle set						
$\square^r$ portion	37x6x2	2.8	0.8	2.240	4.48	1989.12
Δ^r portion	37x6x2	1.1	0.7	0.385	0.77	341.88
Posterior set						
$\square^r$ portion	25x6x2	2.0	0.7	1.400	2.80	840.00
Δ^r portion	25x6x2	1.2	0.7	0.420	0.84	252.00
Gill filaments of the fourth pair of gills						
Anterior set	13x2x2	2.5	0.6	1.5	3.0	156.00
Middle set	38x2x2	3.5	0.8	2.8	5.6	851.20
Posterior set	24x2x2	2.5	0.6	1.5	3.0	288.00
Total respiratory area ..... 5504.44 sq.mm.						

N.B. :- 1. The gill filaments of the first, second and third pairs of gills were fairly triangular at the tips, while the rest of the surface was rectangular.

2. For triangular portions, L = Altitude, LxB = $\frac{1}{2}$ Altitude x Base.

2. Notopterus kapirat (Lacep)

HABITAT : Fresh-water.

VOLUME : 11.0 cc.

NO. OF GILLS : 4 pairs.

GILL-SURFACE PER UNIT VOLUME : 153.2 sq.mm.

Particulars of the gill filaments.	No. of gill filaments	Average length of g.f. in mm. L	Average breadth of g.f. in mm. B	Area on one side of g.f. in sq.mm. L x B	Total area of g.f. in sq.mm. 2L x B	Total area in sq.mm.
Gill filaments of all the gills						
Anterior set	4x8x2	1.0	0.25	0.250	0.50	32.00
Middle set	59x8x2	1.9	0.45	0.855	1.71	1614.24
Posterior set	5x8x2	1.0	0.25	0.250	0.50	40.00
Total respiratory area ..... 1686.24 sq.mm.						

3. Megalops cyprinoides (Brau.)

HABITAT : Marine.

VOLUME : 27.5 cc.

NO. OF GILLS : 4 pairs.

GILL-SURFACE PER UNIT VOLUME : 163.9 sq.mm.

Particulars of the gill filaments.	No. of gill filaments	Average length of g.f. in mm. L	Average breadth of g.f. in mm. B	Area on one side of g.f. in sq.mm. L x B	Total area of g.f. in sq.mm. 2L x B	Total area in sq.mm.
Gill filaments of the first and second pairs of gills						
Anterior set	22x4x2	1.4	0.4	0.56	1.12	197.12
Middle set	105x4x2	3.2	0.4	1.28	2.56	2150.40
Posterior set	27x4x2	1.4	0.4	0.56	1.12	241.92
Gill filaments of the third pair of gills						
Anterior set	13x2x2	1.2	0.3	0.36	0.72	37.44
Middle set	100x2x2	3.0	0.4	1.20	2.40	960.00
Posterior set	15x2x2	2.2	0.4	0.88	1.76	105.60
Gill filaments of the fourth pair of gills						
Anterior set	17x2x2	1.5	0.25	0.375	0.75	51.00
Middle set	77x2x2	3.0	0.40	1.200	2.40	739.20
Posterior set	22x2x2	1.0	0.15	0.150	0.30	26.40
Total respiratory area ..... 4509.08 sq.mm.						

4. Anguilla bengalensis (Day)

HABITAT : Fresh-water.

VOLUME : 30.0 cc.

NO. OF GILLS : 4 pairs.

GILL-SURFACE PER UNIT VOLUME : 91.7 sq.mm.

Particulars of the gill filaments.	No. of gill filaments	Average length of g.f. in mm. L	Average breadth of g.f. in mm. B	Area on one side of g.f. in sq.mm. L x B	Total area of g.f. in sq.mm. 2L x B	Total area in sq.mm.
Gill filaments of the first pair of gills	72x2x2	3.1	0.5	1.55	3.1	892.8
Gill filaments of the second pair of gills	63x2x2	3.1	0.5	1.55	3.1	781.2
Gill filaments of the third pair of gills	56x2x2	2.9	0.5	1.45	2.9	649.6
Gill filaments of the fourth pair of gills	37x2x2	2.9	0.5	1.45	2.9	429.2
Total respiratory area ..... 2752.8 sq.mm.						

5. Ophichthys (Pisoodonophis) boro (Ham.)

HABITAT : Estuaries.

VOLUME : 34.0 cc.

NO. OF GILLS : 4 pairs.

GILL-SURFACE PER UNIT VOLUME : 86.7 sq.mm.

Particulars of the gill filaments.	No. of gill filaments	Average length of g.f. in mm. L	Average breadth of g.f. in mm. B	Area on one side of g.f. in sq.mm. L x B	Total area of g.f. in sq.mm. 2L x B	Total area in sq.mm.
Gill filaments of the first pair of gills						
□r portion	35x2x2	6.0	0.5	3.00	6.0	840.00
△r portion	35x2x2	1.0	0.3	0.15	0.3	42.00
Gill filaments of the second and third pairs of gills						
□r portion	31x4x2	6.4	0.5	3.20	6.4	1587.20
△r portion	31x4x2	1.0	0.3	0.15	0.3	74.40
Gill filaments of the fourth pair of gills						
□r portion	22x2x2	5.4	0.4	2.16	4.32	380.16
△r portion	22x2x2	1.0	0.3	0.15	0.30	26.40
Total respiratory area						2950.16 sq.mm.

N.B. :- 1. The gills were triangular at the tips, while the rest of the surface was rectangular.
2. For triangular portions, L = Altitude, LB = $\frac{1}{2}$ Altitude x Base.

6. Heteropneusteus (Saccobranchus) fossilis (Bloch)

HABITAT : Fresh-water.

VOLUME : 8.5 cc.

NO. OF GILLS : 4 pairs.

GILL-SURFACE PER UNIT VOLUME : 70.3 sq.mm.

Particulars of the gill filaments.	No. of gill filaments	Average length of g.f. in mm. L	Average breadth of g.f. in mm. B	Area on one side of g.f. in sq.mm. L x B	Total area of g.f. in sq.mm. 2L x B	Total area in sq.mm.
Gill filaments of the first, second and third pairs of gills						
Anterior set	3x6x2	1.5	0.2	0.30	0.6	21.6
Middle set	26x6x2	2.5	0.3	0.75	1.5	468.0
Posterior set	5x6x2	1.5	0.2	0.30	0.6	36.0
Gill filaments of the fourth pair of gills	30x2x2	1.5	0.2	0.3	0.6	72.0
Total respiratory area ..... 597.6 sq.mm.						

7. Haplochilus lineatus (Cuv. & Val.)

HABITAT : Fresh-water.

VOLUME : 1.1 cc.

NO. OF GILLS : 4 pairs.

GILL-SURFACE PER UNIT VOLUME : 98.1 sq.mm.

Particulars of the gill filaments.	No. of gill filaments	Average length of g.f. in mm. L	Average breadth of g.f. in mm. B	Area on one side of g.f. in sq.mm. L x B	Total area of g.f. in sq.mm. 2L x B	Total area in sq.mm.
Gill filaments of all the gills	45x8x2	1.0	0.075	0.075	0.15	108.0

Total respiratory area ..... 108.0 sq.mm.

8. Ophiocephalus striatus (Bloch)

HABITAT : Fresh-water.

VOLUME : 15.0 cc.

NO. OF GILLS : 4 pairs.

GILL-SURFACE PER UNIT VOLUME : 92.1 sq.mm.

Particulars of the gill filaments.	No. of gill filaments	Average length of g.f. in mm. L	Average breadth of g.f. in mm. B	Area on one side of g.f. in sq.mm. L x B	Total area of g.f. in sq.mm. 2L x B	Total area in sq.mm.
G.f.of the first and second pairs of gills						
Anterior set	8x4x2	0.6	0.4	0.24	0.48	30.72
Middle set						
□r portion	52x4x2	1.1	0.6	0.66	1.32	549.12
△r portion	52x4x2	0.6	0.5	0.15	0.30	124.80
Posterior set	15x4x2	0.6	0.4	0.24	0.48	57.60
G.f.of the third pair of gills						
Anterior set	5x2x2	0.6	0.4	0.240	0.48	9.60
Middle set						
□r portion	60x2x2	1.0	0.5	0.500	1.00	240.00
△r portion	60x2x2	0.5	0.5	0.125	0.25	60.00
Posterior set	8x2x2	0.6	0.4	0.240	0.48	15.36
G.f.of the fourth pair of gills						
Anterior set	3x2x2	0.6	0.4	0.24	0.48	5.76
Middle set						
□r portion	70x2x2	1.0	0.4	0.40	0.80	224.00
△r portion	70x2x2	0.5	0.4	0.10	0.20	56.00
Posterior set	5x2x2	0.6	0.4	0.24	0.48	9.60
Total respiratory area ..... 1382.56 sq.mm.						

N.B. :- 1. The gill filaments of the middle set were fairly triangular at the tips, while the rest of the surface was rectangular.
2. For triangular portions, L = Altitude, LxB = $\frac{1}{2}$ Altitude x Base.

9. Ophiocephalus punctatus (Bloch)

HABITAT : Fresh-water.

VOLUME : 40.0 cc.

NO. OF GILLS : 4 pairs.

GILL-SURFACE PER UNIT VOLUME : 95.25 sq.mm.

Particulars of the gill filaments.	No. of gill filaments	Average length of g.f. in mm. L	Average breadth of g.f. in mm. B	Area on one side of g.f. in sq.mm. L x B	Total area of g.f. in sq.mm. 2L x B	Total area in sq.mm.
G.f. of the first pair of gills						
Anterior set						
□r portion	11x2x2	1.1	0.5	0.55	1.10	48.40
△r portion	11x2x2	1.0	0.4	0.20	0.40	17.60
Middle set						
□r portion	58x2x2	2.2	1.1	2.42	4.84	1122.88
△r portion	58x2x2	1.0	0.7	0.35	0.70	162.40
Posterior set						
□r portion	6x2x2	1.1	0.5	0.55	1.10	26.40
△r portion	6x2x2	1.0	0.4	0.20	0.40	9.60
G.f.of the second and third pairs of gills						
Anterior set						
□r portion	3x4x2	1.0	0.5	0.50	1.00	24.00
△r portion	3x4x2	1.0	0.4	0.20	0.40	9.60
Middle set						
□r portion	60x4x2	2.0	0.9	1.80	3.60	1728.00
△r portion	60x4x2	0.9	0.4	0.18	0.36	17.28
Posterior set						
□r portion	3x4x2	1.0	0.5	0.50	1.00	24.00
△r portion	3x4x2	1.0	0.4	0.20	0.40	9.60
G.f.of the fourth pair of gills						
□r portion	64x2x2	2.1	0.5	1.05	2.10	537.60
△r portion	64x2x2	0.8	0.4	0.16	0.32	81.92
Total respiratory area						3819.28 sq.mm.

N.B. :- 1. The gills were triangular at the tips, while the rest of the surface was rectangular.
2. For triangular portions, L = Altitude, LxB = ½ Altitude x Base.

10. Anabas scandens (Dald.)

HABITAT : Fresh-water.

VOLUME : 3.0 cc.

NO. OF GILLS : 3 pairs.

GILL-SURFACE PER UNIT VOLUME : 60.66 sq.mm.

Particulars of the gill filaments.	No. of gill filaments	Average length of g.f. in mm. L	Average breadth of g.f. in mm. B	Area on one side of g.f. in sq.mm. L x B	Total area of g.f. in sq.mm. 2L x B	Total area in sq.mm.
Gill filaments of the first and second pairs of gills						
Anterior set	5x4x2	1.0	0.1	0.1	0.2	8.0
Middle set	39x4x2	2.0	0.1	0.2	0.4	124.8
Posterior set	6x4x2	1.0	0.1	0.1	0.2	9.6
Gill filaments of the third pair of gills	50x2x2	1.0	0.1	0.1	0.2	40.0
Total respiratory area ..... 182.4 sq.mm.						

11. Osphronemus gourami (Lacep)

HABITAT : Fresh-water.

VOLUME : 161.0 cc.

NO. OF GILLS : 4 pairs.

GILL-SURFACE PER UNIT VOLUME : 56.8 sq.mm.

Particulars of the gill filaments.	No. of gill filaments	Average length of g.f. in mm. L	Average breadth of g.f. in mm. B	Area on one side of g.f. in sq.mm. L x B	Total area of g.f. in sq.mm. 2L x B	Total area in sq.mm.
G.f.of the first and second pairs of gills						
Anterior set	12x4x2	2.0	0.6	1.20	2.40	230.4
Middle set						
□r portion	85x4x2	3.6	0.9	3.24	6.48	4406.4
Δr portion	85x4x2	0.5	0.4	0.10	0.20	136.0
Posterior set	15x4x2	2.0	0.6	1.20	2.40	288.0
G.f.of the third pair of gills						
Anterior set	12x2x2	2.0	0.6	1.20	2.40	115.2
Middle set						
□r portion	80x2x2	3.4	0.8	2.72	5.44	1740.8
Δr portion	80x2x2	0.5	0.4	0.10	0.20	64.0
Posterior set	15x2x2	2.0	0.6	1.20	2.40	144.0
G.f.of the fourth pair of gills						
Anterior set	4x2x2	2.0	0.6	1.2	2.4	38.4
Middle set						
□r portion	90x2x2	3.0	0.8	2.4	4.8	1728.0
Δr portion	90x2x2	0.5	0.4	0.1	0.2	72.0
Posterior set	10x2x2	2.0	0.6	1.2	2.4	96.0
Total respiratory area ..... 9059.2 sq.mm.						

N.B. :- 1. The gill filaments of the middle set of gills were fairly triangular at the tips, while the rest of the surface was rectangular.

2. For triangular portions, L = Altitude, LxB = $\frac{1}{2}$ Altitude x Base.

12. Macropodus cupanus (Cuv. & Val.)

HABITAT : Fresh-water.

VOLUME : 1.3 cc.

NO. OF GILLS : 4 pairs.

GILL-SURFACE PER UNIT VOLUME : 78.7 sq.mm.

Particulars of the gill filaments.	No. of gill filaments	Average length of g.f. in mm. L	Average breadth of g.f. in mm. B	Area on one side of g.f. in sq.mm. L x B	Total area of g.f. in sq.mm. 2L x B	Total area in sq.mm.
Gill filaments of all the gills	32x8x2	1.0	0.1	0.1	0.2	102.4

Total respiratory area ..... 102.4 sq.mm.

13. Boleopthalmus dussumieri (Cuv. & Val.)

HABITAT : Marine.

VOLUME : 13.0 cc.

NO. OF GILLS : 4 pairs.

GILL-SURFACE PER UNIT VOLUME : 81.35 sq.mm.

Particulars of the gill filaments.	No.of gill filaments	Average length of g.f. in mm. L	Average breadth of g.f. in mm. B	Area on one side of g.f. in sq.mm. L x B	Total area of g.f. in sq.mm. 2L x B	Total area in sq.mm.
Gill filaments of the first pair of gills						
Anterior set	10x2x2	2.2	0.25	0.55	1.10	44.0
Middle set	20x2x2	6.1	0.30	1.83	3.66	292.8
Posterior set	8x2x2	2.2	0.25	0.55	1.10	35.2
Gill filaments of the second and third pairs of gills						
Anterior set	6x4x2	2.0	0.25	0.500	1.00	48.0
Middle set	26x4x2	4.7	0.25	1.175	2.35	488.8
Posterior set	6x4x2	2.0	0.25	0.500	1.00	48.0
Gill filaments of the fourth pair of gills	35x2x2	1.8	0.2	0.36	0.72	100.8
Total respiratory area ..... 1057.6 sq.mm.						

14. Mastecembalus armatus (Lacep)

HABITAT : Fresh-water.

VOLUME : 55.0 cc.

NO. OF GILLS : 4 pairs.

GILL-SURFACE PER UNIT VOLUME : 72.41 sq.mm.

Particulars of the gill filaments.	No. of gill filaments	Average length of g.f. in mm. L	Average breadth of g.f. in mm. B	Area on one side of g.f. in sq.mm. L x B	Total area of g.f. in sq.mm. 2L x B	Total area in sq.mm.
Gill filaments of the first pair of gills	64x2x2	4.8	0.5	2.40	4.80	1228.80
Gill filaments of the second and third pairs of gills	60x4x2	4.4	0.5	2.20	4.40	2112.00
Gill filaments of the fourth pair of gills	54x2x2	3.6	0.4	1.44	2.88	622.08
Total respiratory area ..... 3962.88 sq.mm.						