Hatching and rearing of Gourami, (Osphronemus goramy, Lacepede) in the Polonnaruwa Nursery

W. B. Ellepola and C. H. Fernando

(*Fisheries Field Station, Polonnaruwa, Ceylon*)

GOURAMI have been maintained as spawners in the ponds of the Fisheries Station at Polonnaruwa since 1957, for the production of fingerlings needed for the stocking of the inland waters. The procedure adopted for the rearing of these fingerlings (see Ling 1962, Indrasena and de Silva, 1964, for details) is briefly as follows:—

Artificial nest-frames are provided in the ponds and nests are collected from them as soon as spawning is complete; eggs are removed from these nests in the laboratory, and are reared there in large glass dishes (35 cms. diameter × 15 cms. height) half full of pipe-borne water from a well in the station premises. Here they remain for 14 days: hatching takes place within two days and fry are full grown within another 12. The fry are then transferred to nursery ponds (earth or cement lined) out in the open, where they remain for another 6 weeks before being used for stocking purposes.

Records maintained over the four years 1961-1964 indicate that there has been an increase in the number of eggs per nest, from about 600 in 1961 to about 3,000 in 1964 (Table I). The percentage of these surviving the first two weeks of life, that is to the end of their stay in the laboratory, has also improved—from about 11—18% to about 25%. And though there has been some increase in mortality during the pond stage, that is during the next six weeks of life, the over-all survival during the whole eight weeks period from collection of nests to removal of fingerlings for stocking shows a considerable improvement from about 1.4% in 1961 to about 11.7% in 1964 (Table 1).

Over the whole four year period 342,300 egss were collected from gourami nests and reared; and from them 41,117 eight week old fingerlings were obtained for stocking—a survival of 12.0%. This compared very favourably with the figures reported by Indrasena and Ellepola (1964) of the survival of carp eggs at the same Nursery. In the first of their experiments, of 342fi019 eggs 4,785 hatched out and only 1,490 were alive at the end of 6 weeks — a survival of a mere 0.4%. The second of their experiments gave much the same results; of 273,452 carp eggs 4,786 hatching out and only 1,884 six weeks old fish were obtained — a survival of just 0.69%. The twenty to thirty times better survival of the gourami young here reported might indicate that care in the laboratory during the very earliest days of the life of these young fish has been responsible for the considerably better survival of fry. However, more detailed records which have been kept of eggs collected from four nests in November 1964 indicate that other factors were also operating.

Eggs collected from these four nests were followed more closely, the number dead at the end of each period of 24 hours for their whole two weeks stay in the laboratory being noted, in the hope that clues might be obtained of the most critical period of this early life and hence of the factors that might possibly be leading to mortality during this time. Whilst these statistics showed that, as is fairly usual the first 24 hours are the most vulnerable — between 60 and 90% of the eggs not surviving beyond it; see Table II, nests 1 to 3 where the spoilt eggs at time of collection and others dead at the end of the first day of observation formed 63.40% to 90.61% of those laid in the nest. They also indicate that on occasion the mortality during this period could be very low — only 6% in Nest 4. Reasons could be genetical, physiological (ageing of spawners) or technical (damage to eggs during handling); and relatively simple measures should be possible to ensure regularly better survivals, if either of the last two is operating.

This wide variation is found in other stages too. Thus, eggs per nest ranged from a mere 331 (in Nest 3) to 7,398 (in Nest 1), in this resembling the range in the 159 nests collected during the four years 1961-64 which was about 100 to about 6,500 per nest. Hora and Pillay (1962) have also reported some variation (500—2,500) but not anything like as much as found by us. Another example of the wide variation between the four nests was in the number of fry alive at the end of the 14 day period in the laboratory, which ranged from none at all (0%) upto 71%. Indeed there was only one respect in which these four nests did not differ widely, and that was the number of fingerlings ready for stocking which each nest produced. This was uniformly low and did not reach even 1½% (0.0%—1.1%). Of the 11,590 eggs collected from these four nests only 53 survived to fingerlings stage; that is only 0.45% survived their life in the Polonnaruwa Nursery. It should be noted that this is a survival rate of the same order as that found by Indrasena and Ellepola (1964) for Carp egg produced in this Nursery.

Whilst it is clear from the much better total survivals obtained for the larger number of eggs reared during the four years 1961-64, that these four nests are not fully representative, the great variation in viability of eggs and of fry obtained from them and reared under almost identical conditions is puzzling. As mentioned before genetical and/or physiological (ageing) differences between spawners might well be affecting results and would repay study handsomely.

Casual observations have indicated that fungus attack was associated with the death of eggs and young within the first week of life; and that in the open ponds various insect predators like dragonfly larvae, beetles and notonectid bugs took toll of the fry when they were still small and that other predators did this when they were larger. Measures to eliminate these, even by having the ponds screened or placed within some simple frame-building; greater care in the handling of nests, and the use of some suitable fungicide, would greatly increase the efficiency of production of the Nursery. This would be worth attempting for, during 1962-64, the cost of production, in food alone that was fed to the spawners and to fry and fingerlings, amounted to the considerable sum of Rs. 2 per hundred fingerlings; that is 2 cents per fish of about 1½ — 2 inches in length.

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TABLE I

Year	Number of Nests	Total number of eggs	No. of eggs per Nest		survivals at end of			
					2 Weeks		8 Weeks	
			Average	Range	No.	%	No.	%
1961	24	15,500	646	100—1,500	2,791	18	217	1.4
1962	52	104,600	2,011	500—3,500	10,839	10.4	8,640	8.3
1963	49	121,000	2,469	1,000—6,500	30,160	24.9	20,350	16.8
1964	34	101,200	2,976	2,000—4,200	25,250	24.9	11,910	11.7

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TABLE—II

Expt. No.	Nest collected on	Total no. of eggs	No. of spoilt eggs	%of spoilt eggs	Deaths by end of																								survivals at end of			
					Day 1		Day 2		Day 3		Day 4		Day 5		Day 6		Day 7		Day 8		Day 9		Day 10		Day 11		Day 12		Day 13		Day 14		2 weeks		8 weeks	
					No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
1.	9.11.64	7398	6301	98.7	68	0.91	22	0.3	19	0.3	174	2.4	327	4.4	6	0.08	27	0.4	62	0.8	22	0.3	17	0.2	10	0.13							343	4.6	20	0.27
2.	10.11.64	878	645	73.5	11	1.3	20	2.3	17	1.9	27	3.1	7	0.8	3	0.3	17	1.9	7	0.8	8	0.9											116	13.21	0	0
3.	16.11.64	331	.0	0	210	63.4	42	12.7	79	23.9																							0	0	0	0
4.	21.11.64	2983	12	0.4	166	5.6	59	2.0	260	8.7	110	3.7	96	3.2	0	0	11	0.4	24	0.8	0	0	24	0.8	25	0.8	24	0.8	10	0.3	17	0.6	2145	71.9	33	1.10

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