

2002 HCG trials

In an effort to trigger June sucker (*Chasmistes liorus*) ovulation, the staff at the Fisheries Experiment Station experimentally injected June sucker with human chorionic gonadotropin (HCG). HCG is sufficiently similar, structurally and functionally, to other vertebrate gonadotropin to induce ovulation in many species. Our initial endeavor at hormone-induced ovulation, in June of 1998, was met with limited success (See *Ichthyogram* Volume 9, #3). We suspect our inability to give follow up injections reduced or rate of successful ovulation in the females.

In May of 1999, after the Food and Drug Administration (FDA) relaxed their enforcement of the ban on HCG, we expanded the tests. Using a protocol found successful for spotted sucker (*Minytrema melanops*) and white sucker (*Catostomus commersoni*), we harvested a total of 19,250 eggs from 5 injected females. Around 80% hatched and survival was good (see *Ichthyogram* Volume 10 #3).

On September 7th of 1999 the Food and Drug Administration and Center for Veterinary Medicine (FDA-CVM) approved the use of Chorulon, an HCG product, in male and female brood fish. On May 5th of 2000 we stripped approximately 30,126 eggs from injected females. When choosing females to inject, we looked at secondary sex characteristics such as swollen vent and soft abdomen, however we chose males based on their year classes and lot number in an effort to improve our genetic pool. In the past males were chosen that expressed some milt. Although ovulation was successful the males expressed little to no milt and the number of eggs to reach eyeup was poor.

In the spring of 2001, we did not have enough rearing space to conduct any HCG trials, but in January of 2002, contractors completed construction on the new June sucker facility, enabling us to continue HCG trials.

After these three trial years, several questions were being asked about HCG use on June suckers: How critical is the timing of the injections? What dose of HCG would be most efficient? Could we extract eggs from the ovary to predict the maturity of the eggs? The position of the germinal disc indicates the development stage of the eggs. We attempted to remove eggs from the ovary, for examination of the germinal disc, by inserting a catheter. Several sizes of Teflon catheter tubing (1.73, .97, and .86 mm i.d.) were tested with no success at removing eggs. This is a common technique for sampling egg stage development. June sucker eggs are typically less than 0.5 mm in diameter (Sigler, 1996). The eggs may have been too interconnected or the catheter size may need to be changed.

Three groups were injected starting a month apart, to spread out the injections over time. Sub groups of females in each group received different doses of HCG. Doses are listed in International Units HCG per kg of body weight (IU/kg), controls were injected with saline solution.

Table 1.

Number and gender of June sucker injected for each HCG dosage group

Trail start dates	1,500 IU/kg	1,000 IU/kg	750 IU/kg	500 IU/kg	250 IU/kg	Control
May 6 th , 2002	4 &	3 &	4 &	2 & 16 %	2 &	2 &

June 7 th , 2002	4 &	3 & 1*%	2 &	2 & 16 %	2 &	2 &
July 5 th , 2002	2 &	2 &	2 &	2 & 10 %	0	0

* One male was thought to be a female until it produced milt after the first injection of 1,000 IU/kg

Fish were chosen on their likelihood of successfully spawning. Males of the right year class and lot were chosen if they were expressing any milt at all. Females of the year class and lot needed were chosen if they had a swollen vent and soft abdomen. Fish that had previously been spawned were not chosen. On May, 6th (when wild June sucker are staging) we injected 17 females intraperitoneally with doses indicated in the above table. The fish were checked for ripeness daily for five days and a follow up dose was administered each day. None of the fish ovulated. Beginning on the 8th of May 16 males were injected each day for 2-3 days with 500 IU/kg HCG. Most males had increased sperm production after 2 days all; 16 males had increased sperm production after 3 days.

A second series of injections began on June 7th (the wild fish would be about done spawning now) using different fish but the same doses and protocol. The results were the same. The females from this group were checked for ripeness the day after each injection, 3 consecutive days after the last injection, and again five days after the last injection. Three males from this series were used for a sperm extender and diluents study (see *Ichthyogram* Volume 13, #2). Five days after their last injection 6 of 13 males still expressed milt. No eggs were expressed.

A third series began on the 5th of July (the wild eggs have hatched and the larva have drifted down to the lake by now). Eight females were injected using the same procedure, two for each of the four highest doses. Again none ovulated. Ten males were injected with similar results. Four out of the five male that required a 3rd dose had thick coagulated milt after the first dose.

Two changes were made between the successful trials and the unsuccessful trials. In January, 2002 the water temperature in the June sucker facility increased from 60^o F to about 65^o F. Future trials should include suckers held at lower temperatures. June sucker that have ovulated after HCG injections were being fed either Biokyowa C-2000 or Silvercup catfish diet. The sucker injected in 2002 had been switched to a diet designed for razorback sucker. Deficiencies in one or more essential amino acids can result in the malfunction of the endocrine system (Stoskopf, 1993). We would like to try Ovaprim in 2003. Ovaprim is a Gonadotropin releasing hormone (GnRH) with a dopamine inhibitor. GnRH stimulates the release of gonadotropin from the pituitary, which controls the maturation of gametes through gonadal steroid hormones. Dopamine inhibits the release of gonadotropin. The optimal solution should involve husbandry methods, until we are able to find what we need to get the June sucker to ovulate naturally, HCG can be used.

Stoskopf, M. K. 1993. *Fish Medicine*. W.B. Saunders Company, Philadelphia, PA.

Sigler, W. F. and J. W. Sigler. 1996. *Fishes of Utah*. University of Utah Press, Salt Lake City, Utah.

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