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Copeia, 1996(1), pp. 219–221
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SEX IDENTIFICATION IN JUVENILE GREEN IGUANAS (*IGUANA IGUANA*) BY CLOACAL ANALYSIS.—Most adult lizards are sexually dimorphic, with males being larger and having wider femoral pores (Dellinger and von Hegel, 1990). Adult male green iguanas have larger dorsal crests, dewlaps, and skulls and develop a darker, more reddish coloration than do females (Dugan, 1982; Fitch and Henderson, 1977). These sexually dimorphic features develop gradually as the animal grows (Dugan, 1982).

Rodda (1991) developed a method for sexing adult green iguanas. However, no sexing techniques for hatchling green iguanas have been published. The lack of such techniques has limited the potential of field studies on the population ecology and behavior of this species (Dugan, 1982; Van Devender, 1982).

In 1988, we studied green iguanas at the Fundo Pecuario Masaguaral, a cattle ranch in the central Venezuelan llanos (Guárico state, 8°34′N, 67°35′W). We opportunistically collected 468 recent hatchlings and assessed the sex of all individuals by determining the presence or absence of hemipenes. Hemipenial eversion was accomplished by holding the animal upside-down and applying soft pressure on both sides of the base of the tail, pressing from the tail toward the head. In some cases, it was necessary to open the cloaca slightly.

For a subsample of 84 individuals, the snout–vent length (SVL) was measured to the nearest mm, and cloacal width and depth were measured with a caliper to 0.05 mm. Additionally, to measure the depth of the cloacal pouch in relative terms, a probe was inserted with the hind leg held adjacent to the tail. The depth of the pouch could then be recorded as equivalent to a given number of femoral pores (which extend distally from the cloaca along the ventral surface of the leg). This technique provided a relatively size-independent measure of the depth of the cloacal pouch.

Eversion of the hemipenes proved to be an effective technique for sexing hatchling iguanas (239 females and 229 males), as hemipenes were easily everted. It was also possible to sex em-

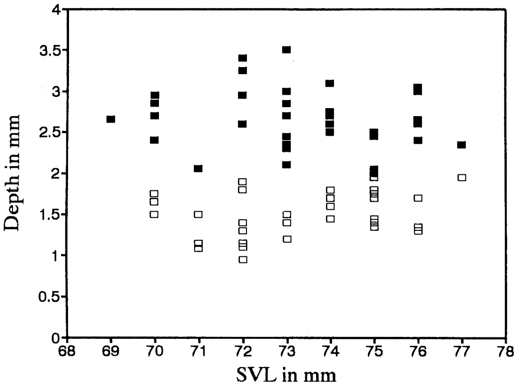

Fig. 1. The relationship between the depth of the cloacal pouch and the snout–vent length in both sexes of juvenile green iguanas. Females are denoted by empty squares, and males are denoted by full squares.

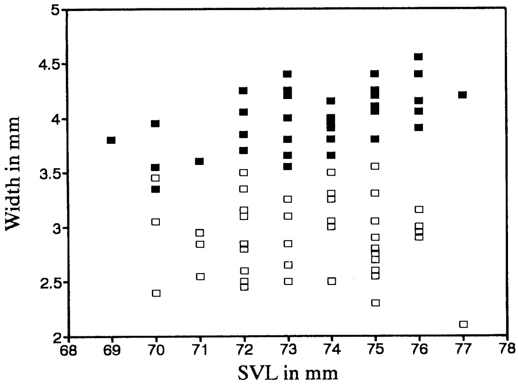

Fig. 2. The relationship between cloacal width and snout–vent length in both sexes of juvenile green iguanas. Females are denoted by empty squares, and males are denoted by full squares.

bryos in an advanced state of development (these came from five eggs accidentally broken while handling, approximately two weeks prior to hatching).

Sex determined through hemipenial eversion was always consistent with the results achieved using the method of Dellinger and von Hegel (1990) for *Amblyrhynchus cristatus*. Cloacal depth was significantly greater in males ($P < 0.01$), both in absolute and relative terms (Table 1, Fig 1). Although in *A. cristatus* the differences are greater (Dellinger and von Hegel, 1990), cloacal width was also significantly greater in male *I. iguana* ($P < 0.01$; Table 1, Fig 2).

For 33 (14 females, 19 males) five-month-old iguanas, the sex determined through the depth of the cloacal pouch (both relative and absolute) was always consistent with that determined through cloacal width, but it was very difficult to evert the hemipenes. The sex determination of these individuals was 100% consistent with a later exam (14 months old) based on hemipenial eversion. At 14 months, sex determination in 92 iguanas (47 females and 45 males), ranging from 131–177 mm SVL, was always consistent based on all these measures: cloacal width, depth of the cloacal pouch and hemipenial eversion.

These results show that it is possible to identify the sex of iguanas before the appearance of secondary characters. Sex of neonates can be determined by eversion of the hemipenes or by measurement of the cloacal pouch depth or cloacal width. Larger juveniles (< one year old) are best sexed by measurement of the cloacal width or the cloacal pouch depth, because of the difficulty of everting the hemipenes in males of this age.

TABLE 1. CLOACAL POUCH DIMENSIONS AND SNOUT–VENT LENGTH (SVL) FOR MALE AND FEMALE GREEN IGUANAS AT HATCHING. Cloacal pouch depth was measured in terms of absolute depth (mm) and femoral pore equivalents (see text). Statistical significance was determined by a two tailed Student t-test.

		Female	Male	*P*
SVL	Min	70	69	
	Max	77	77	
	Mean	73.4	73.5	0.98
	Std	1.85	1.95	
Depth	Min	0.95	1.95	
	Max	1.95	3.50	
	Mean	1.51	2.61	0.001
	Std	0.26	0.41	
Width	Min	2.10	3.35	
	Max	3.55	4.55	
	Mean	2.91	3.96	0.001
	Std	0.35	0.27	
Pore	Min	4	6	
	Max	8	11	
	Mean	6.07	8.62	0.001
	Std	0.78	1.21	

Acknowledgments.—We thank T. Blohm for his collaboration and for his permission to work on his ranch. We also thank the New York Zoological Society (Wildlife Conservation International) for financial support of this work and P. Andreadis, G. M. Burghardt, R. Lord, Z. Tárano, and J. Thorbjarnarson for editorial and technical suggestions in preparation of the manuscript.

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Copeia, 1996(1), pp. 221–223
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LARVAL FISH CLAMP: A TOOL FOR OBSERVING LARVAL FISHES.—Most larval fish descriptions are accompanied by drawings made only of the lateral aspect (e.g., Moser et al., 1984; Okiyama 1986). During the past decade, a few papers were published describing techniques on making detailed larval fish illustrations (e.g., Sumida et al., 1984; Kinoshita, 1987; Trnski and Leis, 1992). These papers contributed greatly to improving the quality of larval fish illustrations published thereafter. However, methods described in these papers were aimed only at illustrating lateral views of larvae. Dorsal, ventral, and anterior views often reveal characters useful for identification, such as pigmentation patterns, cephalic spine formation, etc.

Unfortunately, it is difficult to place and hold larval fish specimens in a position suitable for dorsal, ventral, or anterior observations. In the present paper, a larval fish clamp, a tool to retain larval fish specimens in place for such observation is described. Similar devices are sold to hold mammals (rats, mice, and cats) for physiological experiments. However, for fish, although used regularly by fish physiologists, such retaining devices are custom made (e.g., Peter and Gill, 1975). These are mostly for larger adult fishes and are not suitable for use on larval fishes.

Construction.—The main part of the clamp is made of transparent acrylic plastic (Figs. 1–2). But flat black, if available, may be better to avoid reflections that may hinder observations. For metal parts, we used stainless steel. If small elongate larvae are the main specimens to be held in place by the clamp for observation, it is advisable to use the weakest spring one can find. Construction should not be very difficult using conventional shop tools. A list of parts is given in Table 1.

First, cut out all the necessary acrylic plastic parts and make a "kit" of the clamp. Sand the sides and round the corners of each part with either a file or sand paper. Then drill the holes in each board as shown in Figure 1. Make a pair of grooves in the side plate by making a series of 2 mm holes forming a line. With a file or a piece of sand paper, sand this line of holes into a groove. This groove will function as a loose guide for the guide rods. It is ideal to make an indentation 4–5 mm in diameter, 1 mm deep, at the center of one side of the retaining board for the tip of the adjusting screw to go in.

Begin construction by screwing the two side plates to the two base plates. There should be an opening 18 mm wide between the two base plates. Next, screw in a pair of guide rods to each retaining board. Attach the springs and the washers to the retaining rods on one of the retaining boards. Attach each completed retaining board to the side plate by making the guide rod enter through the grooves made on the side plate. Note that, in Figure 1, the spring and the washers are attached to only one of the two retaining boards. Finally, attach the adjusting screw to the side plate.

Adjustment.—The force applied to the specimen to be held in place by the clamp is controlled by turning the adjusting screws on either side of the clamp. The presence of the retaining spring on only one side of the clamp enables the user to adjust the force applied to the spec-