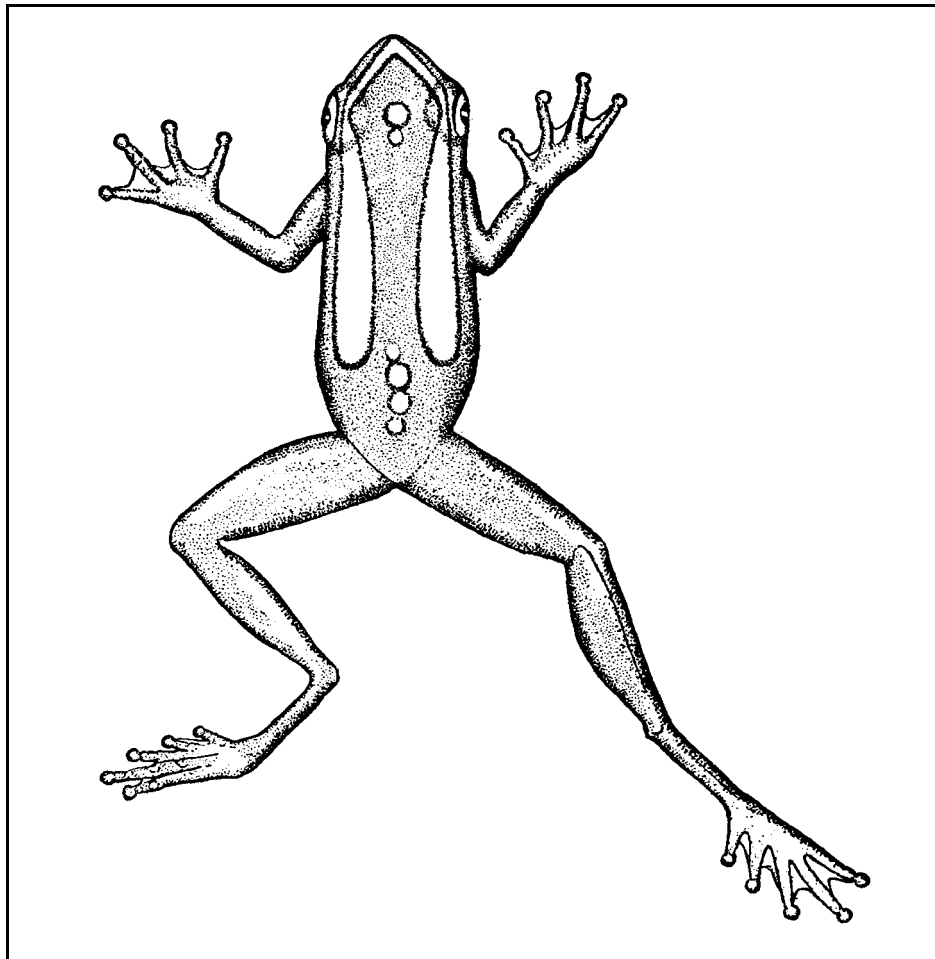

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BULLETIN OF THE CHICAGO HERPETOLOGICAL SOCIETY
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Riparian Tadpoles: *Hoplobatrachus tigerinus* (Daudin, 1802) with Notes on Breeding Habits and Feeding Ecology

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Introduction

Hoplobatrachus tigerinus, the fairly common Indo-Pakistan "tiger frog" (Figure 1) is the largest, most colorful amphibian in the plains of Punjab. Its blotched green and bright yellow garb and distinct, vividly yellow dorsal streak distinguish it from the rest of the local amphibians. It frequents marshy areas, wetlands, and grasses around ponds and puddles below 1000 m throughout Pakistan, Kashmir and into eastern Afghanistan (Khan, 1976, 1979, 1980). It is diurnal but secretive, spending most of its time in moist environs among the roots of grasses around ponds and puddles. When alarmed it immediately jumps into the water, burying itself in the debris at the bottom. It is voracious feeder on a variety of items, including insects, amphibians, lizards, snakes, small mammals and birds. Odd tidbits like human hairs, cattle dung and grass have also been found in its stomach contents (Khan, 1973).

Breeding is triggered by the first monsoon showers during mid-July and lasts till mid-monsoon (i.e., mid-August) (Khan and Malik, 1987). The male is more active with characteristic bright yellow coloration, while the female is relatively sedentary and modest in color. When rain falls, males gather in low-lying areas, where water is fast accumulating, and croak in chorus, a characteristic, nasal, voluminous "cronk, cronk, cronk" repeated 6-8 times in succession. There is moderate scuffling among males trying to reach females; amplexus is axillary. The pair moves away to lay eggs, which are laid in small, loose, gelatinous patches that float for some time, but soon sink in the deep water, developing into tadpoles within a week (Khan, 1982).

This paper describes the external morphology of the *H.*

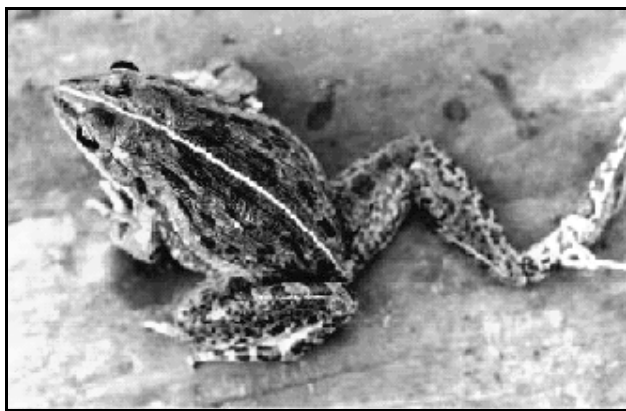


Figure 1. *Hoplobatrachus tigerinus* male.

tigerinus tadpole, with notes on its ecological correlates and habits.

Materials and Methods

The tadpoles for this study were collected from different localities by dredging along the bottom of various ponds and puddles lying along the northwestern border of Rabwah City. Comparative material was available from Ghakkhar, District Gujranwala, and Datta and Manshera, N.W.F.P., the tadpoles were preserved in Bouin's Fluid and stored after dilution 1:1 with water (Khan, 1965).

A binocular laboratory microscope was used to study details of external morphology of the tadpole; drawings were made with the help of a camera lucida.

Description

Tadpole (Figure 2): Body and tail are muscular and cylindrical. The oblong body is as broad as high, with parallel lateral walls; its ventrum is flat. An infraocular bulge due to the enormously developed jaws and associated musculature is characteristic of this tadpole (Khan, 1996). The anteriorly located mouth is surrounded by a circular oral disc free of papillae. Eyes are large, dorsal in position, lying in the anterior half of the head. The nares are small, dorsolateral in position, and nearer to eyes than to the tip of snout. The spiracle is round, lies midway up on the left side, and is nearer to body end than to the oral disc. The spiracle tube is small and posteriorly directed at an angle of 45° to the long axis of body. The base of the spiracle is about three times as broad as the diameter of the opening. The anal tube is relatively short, mesial, and collapsed so that its dextral or sinistral position is not clear.

The tail is very muscular, with narrow, weak fins. It is almost round in cross section, and is about 2½ times longer than the body. At its base the tail is as high as the body. It is broadest at the middle, then becomes narrower and tapers even-

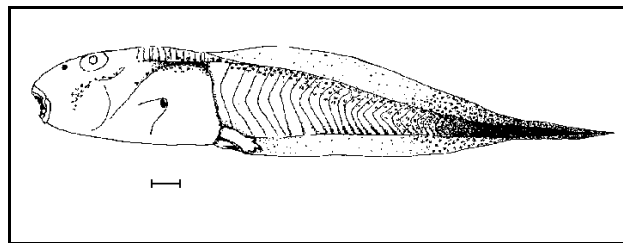


Figure 2. *Hoplobatrachus tigerinus* tadpole at Stage 35 (scale bar = 1 mm).

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ly to an acute tip. The rather narrow fins are a bit broader dorsally, forming a narrow crest along the posterior one-fourth of the tail.

Color: Head and body are gray, with a large patch of melanophores below the eyes and along the dorsum of the body. Tail and fins are darkly speckled, while the posterior one-fourth of the tail is heavily pigmented.

Measurements in mm (data from 10 specimens): Body length 12.5–13; tail length 25.4–25.9; total length 38.9–40; greatest breadth of body (at the level of eyes) 7–7.13; interorbital space 2.2; internarial space 1.6–1.8; tail muscle height (at base) 4.80–4.59; tail height (at mid tail) 6.5; body depth 6.1.

Oral disc (Figure 3): The oral disc is anterior, circular, without papillae, and emarginate. The labia are semicircular. The anterior labium has an outer complete and four inner mesially broadly interrupted rows of keratinized triserial, cylindrical sharp-tipped teeth. The posterior labium has two outer complete tooth rows, second being longest, while the inner three are mesially broadly interrupted. The dental formula for the *Hoplobatrachus tigerinus* tadpole is 5(4+ 4)/(3+ 3)5. A typical tooth is a cylindrical dark-brown keratinized structure, 0.4–0.45 mm long, which gradually tapers to a pointed tip. The teeth are triserially arranged in rows.

The dark brown, keratinized beak is a prominent feature of the oral disc. The upper jaw is a strongly arched structure, with a sharp, serrated free edge; it is mesially produced into a large serrated tooth. Flanks of the upper jaw are flat and enclose the lower jaw laterally. The lower jaw is narrower, non-serrated and sharp-edged. It is mesially excavated into a U-shaped concavity into which the median tooth of the upper jaw bites when the mouth is closed.

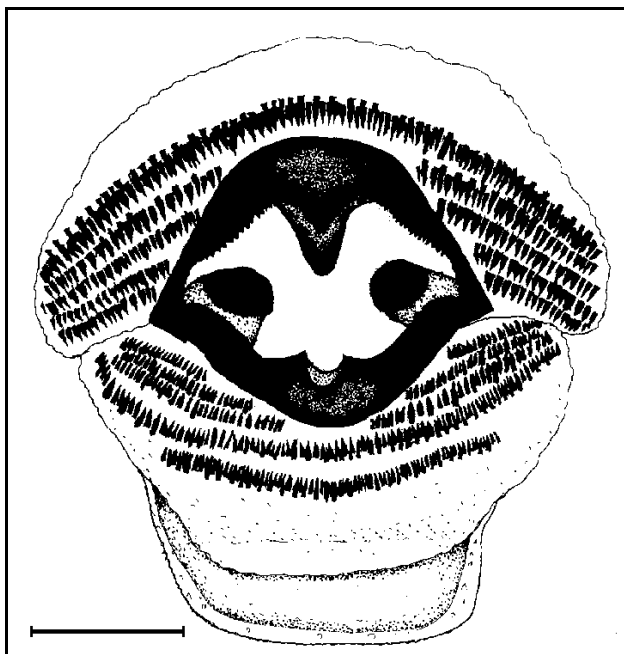


Figure 3. *Hoplobatrachus tigerinus* tadpole oral disc (scale bar = 1 mm).

A long, keratin-tipped, cylindrical papilla is present on each side within the buccal cavity. There are no oral papillae. The posterior labium can be expanded into a broad, wide sucker, when necessitated in lotic environments for attachment to supports against the water current.

There is considerable confusion in the literature regarding the number of tooth rows on the oral disc of the *H. tigerinus* tadpole. Annandale and Rao (1918) recorded five tooth rows on each labium in tadpoles from the eastern Himalayas, while Boulenger (1920) and Boulenger and Annandale (1918) record dental formula 3-4/4-5 and an entirely papillated oral disc; Liu and Hu (1961) record 4(1-4)/4(1-3) dental formula in tadpole from China. The confusion of McCann regarding the dental formula of this species (1932; Figures 1 and 2) is depicted by figuring an oral disc which is neither like that of *Euphlyctis cyanophlyctis* nor *H. tigerinus*. Minton (1966) records a smooth-edged oral disc with three long and two short tooth rows on anterior, two long and one short row on posterior labium of this tadpole.

Ecological correlates

The *H. tigerinus* tadpole remains solitary throughout its life. It is a voracious feeder—an obligate macrophagous, cannibalistic carnivore, mainly larvivorous (Mohanty-Hejmadi and Dutta, 1981; Khan, 1996). It has never been observed feeding on vegetation, nor have gut contents revealed any vegetarian habits. Breeding times of *H. tigerinus* and the common toad *Bufo stomaticus* are synchronized. *Bufo* larvae are the staple food source for *H. tigerinus*, while *Limnonectes syhadrensis*, *E. cyanophlyctis* and *Microhyla ornata* tadpoles are rarer items in its diet. Larger zooplankton like copepods and *Daphnia*, which are filtered from the incoming water current, also form a considerable portion of this tadpole's diet. Other rarely ingested items include water beetles, bugs, naiads and larvae of fishes.

Many local amphibians breed in ephemeral puddles and

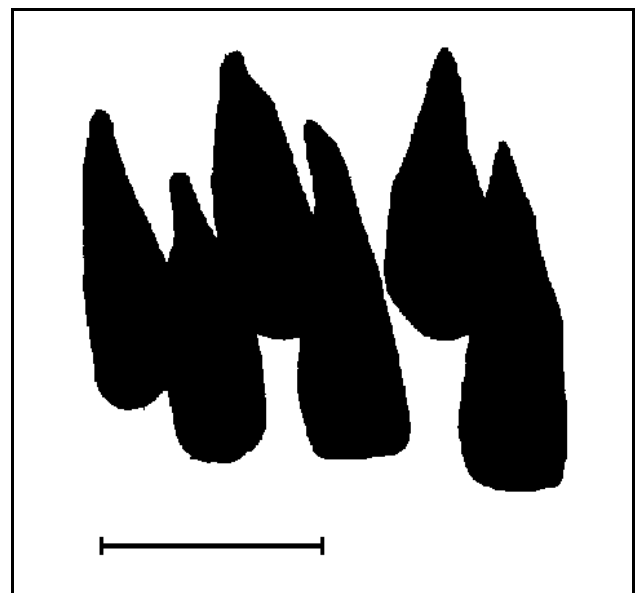


Figure 4. *Hoplobatrachus tigerinus*, a group of labial teeth (scale bar = 0.25 mm).

shallow margins of large water bodies in low-lying areas (Khan and Malik, 1987). Later, tadpoles of the various species migrate to different niches in relatively deeper water. The *H. tigerinus* tadpole lolls at the bottom; its dorsally located eyes enable it to observe activity taking place above in the water column. As a prey item comes within striking range, it darts, grabbing the prey in its powerful jaws, then settles at the bottom, subduing the prey by cutting large chunks from its body. Its powerful, muscular tail with low fins is a tool for quick and agile movements in the water column. The tadpole periodically rises to the water surface to fill its lungs, quickly ascending and descending in the water column, since at middle depths it is highly exposed to attacks from its enemies. In ephemeral shallow pools it scurries to the margin of the pond for this purpose. It avoids predatory fishes, naiads, turtles etc., by confining itself to deep water among the roots of submerged grasses.

Each species of riparian tadpole represents a morphotype, and occupies a particular ecological niche in the shared habitat (Thibaudeau and Altig, 1988; Altig and Johnston, 1989; Khan, 1991). The riparian amphibians differ in their breeding times, calling sites, egg-laying sites, larval habits, larval developing sites, and larval feeding habits (Khan and Malik, 1987). The predaceous *H. tigerinus* tadpole is a free-lancer; it invades the niches of sympatric tadpoles to prey on them. Tadpoles in such situations usually take refuge under debris at the bottom to avoid it.

The cylindrical body, dorsal eyes, anterior disposition of mouth, oral disc without papillae, hypertrophied jaws and associated musculature, peculiar multiserial teeth, suctorial post-oral labium are characteristics of carnivorous *H. tigerinus* tadpole. Altig and Brodie (1972) and Wassersug and Heyer (1983) have shown the drag force of the water current depends on the tadpole's body profile; the cylindrical body of the *H. tigerinus* tadpole flexes with the currents and eddies, reducing the chance of the tadpole being swept downstream. Unlike the similarly lentic/benthic *Bufo* and *E. cyanophlyctis* tadpoles, its

body is cylindrical, reducing drag force as it darts after its prey. The dorsal disposition of the eyes reflects on its natural resting position (Löschenkohl, 1986), and enables it to survey all the activity taking place in the water column. The circum-oral chemosensitive papillae and palps, which help a tadpole in handling food (Altig and Brodie, 1972), are lacking in *H. tigerinus*. The eyes appear to be the main prey-detecting and food-monitoring organ. The anteriorly disposed mouth quickly dismembers the struggling prey (Lynch, 1973), while fine-tipped, cylindrical, triserial teeth hold the prey item by piercing into its body. Cuspless teeth have also been reported in larvivoracious leptodactylids (Starrett, 1973), *Scaphiopus holbrookii*, *S. hurterii*, *Spea hammondi* and *Ascaphus* tadpoles (Gosner, 1959).

During summer when most of the temporary breeding sites in Punjab are teeming with different species of tadpoles, these sites, if not replenished by subsequent rains, tend to dry out quickly due to high temperatures. As water level falls, tadpoles and potential predatory aquatic animals are concentrated in the fast-drying pool, and interact with each other. Except *Microhyla ornata* (which rarely breeds in temporary sites), tadpoles resort to carnivory, because protein rich diet hastens the metamorphic process. However, herons and other predatory birds take their toll of struggling tadpoles. A few tadpoles, having burrowed in mud, survive if rain comes soon. The ultimate surviving tadpoles in such concentrated situations are mostly *H. tigerinus*, if not picked up by predators.

Lactate and pyruvate level in tadpole's tail vary little during intense swimming (Gatten et al., 1984), so that energy deficit is an important constraint on swimming ability of the tadpole; they cannot outswim their predators as fishes do. The tadpoles living in open ponds with little or no vegetation mostly reduced their conspicuousness by being drab in color, while those in ponds with much vegetation are camouflaged by being spotted. The dark tail of *H. tigerinus* may serve to deflect attack from vitally important body to a relatively less important part (Caldwell et al., 1981; Kehr and Basso, 1990).

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Effects of Tail Autotomy on Dominance Status in the Common Five-lined Skink, *Eumeces fasciatus*

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Abstract

We studied the effects of tail autotomy on the dominance status of adult male *Eumeces fasciatus*. We conducted pairwise dominance contests in an arena between adult male *E. fasciatus* and analyzed two behaviors (dominant approach and tongue flicks) before tail autotomy to assess dominance. For those lizards which were originally dominant, we autotomized the tail and reassessed dominance pairing with the original partner. There was no reversal in dominance after tail autotomy in any of the contests; however, dominant lizards did not reassert dominance in after tail autotomy contests. Our results suggest that tail autotomy does not reverse social dominance in adult male *E. fasciatus*.

Tail autotomy is common in lizards (Arnold, 1984) as mechanism to help them escape predation at the moment of predator encounter. However, tail autotomy has several associated long-term costs (Arnold, 1988). Tail autotomy may affect locomotor performance and has been shown to impair escape from predators (Dial and Fitzpatrick, 1984). Tail autotomy can also have an energetic cost by diverting energy from growth and activity to tail regeneration (Smyth, 1974; Dial and Fitzpatrick, 1981). Another potential cost of tail autotomy is reduced social status. Berry (1974) was the first to anecdotally observe loss of dominant status in male *Sauromalus obesus* after tail autotomy. Fox and Rostker (1982) also reported that dominance relationships reversed in juvenile *Uta stansburiana* after autotomy of the dominant lizard's tail. In contrast, Kaiser and Mushinsky (1994) reported that male *Anolis sagrei* did not lose dominance after tail autotomy. Fox et al. (1990) suggested that a lizard could have reduction in social status after tail autotomy because of reduction in body size and loss of an organ of balance decreasing a dominant lizard's ability to fend off male competitor's attacks. Therefore, tail autotomy may have negative effects on an individual's fitness in lizards.

In our study we designed an experiment to determine the effects of tail autotomy on dominance between breeding condition adult male *Eumeces fasciatus*, a nonterritorial, active foraging, and sexually dimorphic scincid lizard inhabiting eastern North America (Fitch, 1954). Although adult male *E. fasciatus* are not territorial, Fitch and von Achen (1977) stated they establish residence in an area for a relatively short period during the breeding season. *Eumeces fasciatus* is also fossorial, making it an ideal candidate for comparative study with *U. stansburiana* which is a more visually oriented lizard species (Fox and Rostker, 1982). Given the demonstrated social costs of tail autotomy in *U. stansburiana* (Fox and Rostker, 1982), we hypothesized that tail autotomy would be an important factor determining dominance in male *E. fasciatus*. Specifically, we addressed the question: Does tail autotomy change the dominant male's social status in male *E. fasciatus*?

Materials and Methods

Eumeces fasciatus were collected in Montgomery County, Tennessee, during April-May 2001. Laboratory trials were conducted at Austin Peay State University during the same timeframe. Skinks were maintained separately with visual barriers in glass terraria (76 cm × 29 cm × 29 cm) in a room adjusted to ambient outdoor climate and light as well as with heat lamps for 8 h per day for proper thermoregulation. Lizards were given water ad libitum and fed crickets until satiation every third day. Adult male *E. fasciatus* were identified based on previously established criteria (Fitch, 1954).

We conducted dominance contests that were a variation of those employed by Fox and Rostker (1982). In this study we tested dominance only in adult *E. fasciatus* males. During the breeding season, male *E. fasciatus* have only two types of reactions to one another (Cooper and Vitt, 1987). They are either completely indifferent or immediately hostile. When males are indifferent, there is no apparent reaction to one another. When one or both males are hostile, one will retreat immediately or they will fight until one male retreats. Thus, retreat is an unambiguous indicator of a dominant-submissive relationship.

We recorded the duration of the contest, as well as behaviors displayed during the contest. Although all behaviors were recorded, only dominant approach and tongue flicks prior to retreat occurred in sufficient frequency to analyze. Duration of the contest was recorded from the beginning time of the trial (when dividers between the lizards were removed) to until one of the males retreated. Dominant approach was defined as the sequence when one lizard rapidly approached the other lizard followed by the retreat of the approached lizard. A mature reproductive female was present in the contest arena without a barrier from the males to provide visual and pheromonal stimulus for male aggression.

We attempted to evaluate all possible pairwise comparisons of similarly sized males to determine initial dominance relationships. However, because the skinks were captured at different times and time in captivity was limited to a three-

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week period we were not able to hold all captured males simultaneously. Thus, the actual number of contests was limited to 28 pairwise contests for a sample of nine males. Contests in which a dominance relationship could be assigned were repeated with the same pairs after complete autotomy of the dominant lizard's tail to assess the effect of tail autotomy on dominance. We induced the lizard to autotomize its tail by squeezing the base of the tail with our fingers to simulate a predator's bite. We analyzed the contest data before and after autotomy with Pearson Chi Square test and Wilcoxon Signed Rank test in the JMP® Statistical Program.

Results and Discussion

Ten out of 28 contests resulted in a clear dominance relationship. We used these ten as a basis to test dominance after tail autotomy. Four out of ten post-autotomy contests had a reassertion of dominance by the pre-autotomy dominant male. In no case was there a dominance reversal as a result of tail autotomy. There was a significant difference in dominant approach between dominance contests before and after autotomy, indicating that dominant males in pre-autotomy contests did not reassert dominance post-autotomy (Pearson $\chi^2 = 8.57$, $n = 10$, $p = 0.003$). Tongue flick rates were significantly higher on average in the before autotomy contests (11.4 tongue flicks per skink per contest) compared to after autotomy contests (1.6 tongue flicks per skink per contest) ($T^+ = 18.5$, $n = 20$, $p = 0.005$).

After dominance was established in our study, the subordinate *E. fasciatus* backed down from the advances of the dominant lizard in four out of ten contests even though the dominant lizard's tail had been autotomized. However, in six out of ten contests the dominant lizard did not reestablish dominance in the post-autotomy contests. Although we found no reversal of dominance, we cannot further distinguish whether initially dominant males retained their dominance status (so that no reinforcement of dominance was necessary), or whether the initially dominant males had lost social status. However, when two male lizards are presumably subordinate, they should fight to establish dominance. Thus, it is more likely that no reinforcement was necessary. In all cases there was no combat between the male lizards in the post-autotomy contests. We observed a decreased number of tongue flicks, perhaps indicating that skinks could recognize previous combatants. A similar conclusion was reached by Lopez and Martin (2001)

who saw decreased levels of aggression in contests between *Podarcis hispanica* in which dominance relationships had been previously established.

Past studies have found both no reversal and reversal in dominance after tail autotomy. We briefly discuss our findings in relation to these studies. Consistent with our findings, Kaiser and Mushinsky (1994) found no reversal in dominance after autotomy of the dominant lizard's tail in adult male *Anolis sagrei*. However, in contrast with *E. fasciatus*, dominant *A. sagrei* did reassert their dominance after tail autotomy. In our study we kept our males separated between pre- and post-autotomy contests. However, Kaiser and Mushinsky (1994) designed their research to simulate natural conditions by permitting males to be in constant contact with each other throughout the study. They speculated that the daily contact of males with males in neighboring territories led to the fighting post-autotomy because loss of territory would translate into decreased reproductive success. Conversely, male *E. fasciatus* may not fight in post-autotomy contests because they are less territorial than *A. sagrei*.

In contrast, Fox and Rostker (1982) found reversal in dominance after tail autotomy of the dominant lizard's tail in juvenile *Uta stansburiana*. Fox and Rostker's (1982) dominance contest experiments used *Uta stansburiana*, an iguanid that communicates at a distance with visual displays including head bobbing, body push-ups, enlarging of the throat, open mouth displays, and tail wags. The tail wag display would not be possible after tail autotomy, and may explain the loss of dominance in autotomized *U. stansburiana*.

To our knowledge our study was the first to examine the effects of tail autotomy on dominance in skinks. *Eumeces fasciatus* are fossorial in nature (Fitch, 1954). Consistent with a fossorial nature is less reliance on visual and greater reliance on chemosensory modality. Thus, once a dominance relationship was established, tail autotomy would probably not affect this relationship as much as it would a visual specialist.

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Selected Year 2003 Amphibians and Turtles from Chihuahua and Sonora, Mexico

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Abstract

One species of turtle, and nineteen species of amphibians are recorded. Previously unreported hybrids of *Bufo mazatlanensis* and *B. punctatus* are noted. Of special interest is one species (*Gastrophryne mazatlanensis*) previously unrecorded from Chihuahua; three species (*Pachymedusa dacnicolor*, *Rana magnaocularis*, *Smilisca baudinii*) for which northernmost records are provided in Sonora; and one species (*Rana chiricahuensis*) for which the southernmost record in Sonora is provided.

All of the following were collected by JLE during the summer of 2003 in Chihuahua (if not otherwise indicated) and Sonora. All catalog numbers refer to the herpetological collection of Unidad de Biotecnología y Prototipos (UBIPRO).

Ambystoma rosaceum Taylor. 11102-41, 4 km N Cuiteco (27°26'53.2"N, 107°58'35.8"W), 1755 m; 11142-3, 2 km N Bahuichivo (27°25'2.4"N, 108°3'57.8"W), 1523 m; 11144-74, 1 km SE Areponapuchi (27°30'47.0"N, 107°51'55.6"W), 2179 m; 11175-86, Estación Bahuichivo (27°21'57.7"N, 108°9'7.9"W), 1519 m; 11187-9, 8 km N Cuiteco (27°27'44.8"N, 107°56'50.9"W), 2147 m; 11190-289, km 48 Creel-San Rafael (27°31'15.6"N, 107°50'48.7"W), 2191 m; 11827, Ejido Gorogachi (27°16'21.1"N, 108°32'16.4"W), 730 m.

Nos. 11175-86 and 11827, 39–67 mm TTL, are all more or less evenly black reticulated on a very light background, except for a lateral, pigmentless line presumably correlated

with the lateral line system. All of the others are 21–31 mm TTL, uniformly black on dorsum and sides, venter lighter, except for one at 44 mm that is lightly pigmented all over, not reticulated. The significance of this pattern variation is unknown, but may simply be ontogenetic. If so, the change is remarkably rapid between 31 and 39 mm TTL.

Bufo alvarius Girard. 112626, 11855, Güisamopa, Sonora, municipio Sahuaripa (28°39'9"N, 109°6'57.1"W), 671 m.

These two specimens, 57 and 67 mm SVL, exhibit the typical unique features of this species, which is well known in northern and eastern Sonora. The postriatal tubercle is conspicuously white in the smaller specimen, less so in the larger.

Bufo marinus (Linnaeus). 11381, Vado de Cuba (27°25'1.6"N, 108°32'48.8"W), 430 m; 11537, Chínipas (27°23'39.9"N, 108°32'9.7"W), 469 m.

Both individuals are small, 36 and 93 mm SVL. It is

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common in the southwestern part of the state.

Bufo mazatlanensis Taylor. 11536, 11700, 11752-79, 12000-99, Chínipas (27°23'39.9"N, 108°32'9.7"W), 469 m; 11623-5, betw Güisamopa and rd to Sahuaripa, Sonora (28°37'11.8"N, 109°7'4.2"W), 746 m; 11639-43, Santa María, Moris (28°12'20.9"N, 108°31'36.7"W), 794 m; 11649-56, 11671-3, Valle de Tacupeto, Sonora (28°17'30.3"N, 109°17'10.9"W), 555 m.

Nos. 11752-79 and 12000-99 are transformlings; their identification is conjectural. All of the others have a middorsal light streak (somewhat obscured in a few). The cranial crests are smooth (not tuberculate), narrow, elevated and blackened. The largest is 90 mm SVL.

The species has been recorded as far north as 35.5 mi S Nogales (Langebartel and Smith, 1954).

Bufo mazatlanensis × *B. punctatus*. 11516-9, 11751-2, Chínipas (27°23'39.9"N, 108°32'9.7"W), 469 m.

These 6 specimens, 49–69 mm SVL, are distinctly different from both *B. punctatus* and *B. mazatlanensis*, which occur sympatrically in the vicinity of Chínipas, but combine the characters of the two. Details are published elsewhere.

Bufo mexicanus Brocchi. 11588-92, km 17 Creel-San Rafael (27°40'1.1"N, 107°44'42.7"W), 2233 m.

Interorbital cranial crests absent; parotoid gland narrowly separated from upper eyelid by a small postorbital crest; inner metatarsal tubercle black, free-edged, the outer one very small, black; a transorbital light line.

Bufo occidentalis Camerano. 11636, Santa María, Moris (28°12'20.9"N, 108°31'36.7"W), 794 m.

This large specimen, 77 mm SVL, has well-developed supraorbital and parietal crests, but no supratemporal crest; the parotoid contacts the eyelid; the metatarsal tubercles are brownish, not black; dorsum mottled; venter immaculate.

Bufo punctatus Baird and Girard. 11599, General Trias (28°25'5.9"N, 106°25'55.4"W), 1516 m; 11630-2, Moris (28°8'51.6"N, 108°31'21.8"W), 772 m; 11701, Las Borregas, Chínipas (27°23'4.3"N, 108°32'21.1"W), 470 m.

The four from southwestern Chihuahua are juveniles 24–33 mm SVL. The one from Gral. Trias, east of the Sierra Madre Occidental, is an adult 62 mm SVL, and differs markedly from the juveniles in coloration, being uniform light tan on dorsum, sides and limbs, and having a few faint, diffuse small dark spots on chest. The juveniles, on the contrary, have numerous sharply defined black spots on throat, chest and abdomen almost to groin, as well as on the sides of the head and body. The limbs are banded, although in one dark specimen the bands are dimly visible. Red-spotted warts and vertically oval paratoid glands are present in all, and there are no cranial crests.

The differences described suggest that more than one taxon is represented in the populations now referred to the single species *B. punctatus*.

Eleutherodactylus tarahumaraensis Taylor. 11600, km 17 Creel-San Rafael, mpio Urique (27°40'1.1"N, 107°44'42.7"W), 2233 m.

The single specimen is 24 mm SVL, and is from within the known range of the species as summarized by Tanner (1989) and Webb (1984). Bogart (1970) reported its karyology.

Gastrophryne mazatlanensis (Taylor). 11674, La Loma, Moris (28°8'48.7"N, 108°31'40.8"W), 790 m.

The specimen is 17 mm SVL. The hind legs are prominently barred, the sides darker than the dorsum, and there are dark spots in the groin, anal region and dorsum. There is no transverse occipital fold, as noted in the original description.

This is the only specimen known of the species from Chihuahua. Nelson (1972) did not recognize it as distinct from *G. olivacea*, and numerous authors have regarded it as a subspecies of *G. olivacea*. Most conspicuously, the west coast population differs from *G. olivacea* in lacking a postorbital occipital fold. Other differences have been recorded in size, call, coloration, distribution and habitat.

Hyla arenicolor Cope. 11045-101, km 26 San Juanito-Basaseachi, mpio Bocoyna (27°58'41.1"N, 107°39'43.0"W), 2402 m; 11507, Milpillas, mpio Chínipas (27°12'9.7"N, 108°38'47.3"W), 1250 m; 11595, km 17 Creel-San Rafael, mpio Urique (27°40'1.1"N, 107°44'42.7"W), 2233 m.

The series 11045-101 consists of tailless transformlings about 17 mm SVL. The other two are adults. The one from Milpillas was taken at a much lower altitude than others in Chihuahua.

Hyla wrightorum Taylor. 11593, km 17 Creel-San Rafael, mpio Urique (27°40'1.1"N, 107°44'42.7"W), 2233 m.

This adult is from well within the known range of the species.

Pachymedusa dacnicolor (Cope). 11676-7, Valle de Tacupeto, Sonora (28°17'30.3"N, 109°17'10.9"W), 555 m.

The two specimens are half grown, at 35 mm SVL. They are uniform greenish gray above (in preservative), with numerous, small, discrete white spots scattered over dorsum. This is the northernmost locality reported for the species; others are from Cd. Obregón southward (Duellman, 2001).

Rana berlandieri Baird. 11629, km 23.5, Basaseachi-Ocampo (28°11'5.3"N, 108°22'6.8"W), 2293 m.

An adult, 58 mm SVL; dorsolateral folds broken posteriorly; skin on sides smooth; posterior surface of the thigh dimly reticulated; 3 spots on head, 18 on body between dorsolateral folds.

Rana chiricahuensis Platz and Mecham. 11621, betw Güisamopa and Cajón de Onapa, Sonora (28°43'12.5"N, 109°6'24.2"W), 597 m.

This adult has the diagnostic features of the species, with a tuberculate skin and white tips on the tubercles on the posterior side of the thighs. The only recorded locality for the species in Sonora is Río Santa Cruz, 6.4 km S international border,

near Lachiel (Platz and Mecham, 1979). The present locality is in the middle of the state, near its eastern border.

Rana lemosespinali Smith and Chiszar. 11716, Arenopanuchi, mpio Urique (27°30'27.1"N, 107°50'36.2"W), 2222 m.

This is the third known locality (Smith and Chiszar, 2003) for the species, although all are from the same region. This specimen is 41 mm SVL, with broken dorsolateral folds, 5 spots on head, 34 on body between dorsolateral folds, lateral skin granular, posterior surface of thighs reticulated above, unmarked on lower half.

Rana magnaocularis Frost and Bagnara. 11515, Milpillas, mpio Chínipas (27°12'9.7"N, 108°38'47.3"W), 1250 m; 11622, betw Güisamopa and Cañon de Onapa, Sonora (28°43'12.5"N, 109°6'24.2"W), 597 m; 11698-9, Rancho El Jordán (27°23'16.8"N, 108°32'39.6"W), 469 m; 11724-31, Los Llanos (27°20'18.1"N, 108°19'27.2"W), 1272 m; 11732-45, 3 km S branch to Guasapares (27°19'21.0"N, 108°18'12.8"W), 1384 m.; 11748-9, 11829-30, Chínipas (27°23'39.9"N, 108°32'9.7"W), 469 m; 11828, Ejido Gogogachi (27°16'21.1"N, 108°32'16.4"W), 730 m.

The Sonora locality is the northernmost known for the species. The specimen from there has a complete labial light stripe, contrary to the incomplete one in *R. yavapaiensis*, a related species occurring farther north near the international border.

Every specimen has a dark spot on each eyelid, although small in a few; 12 have a spot on the snout, and the spots on body between the dorsolateral folds are 8–23 (\bar{x} = 17.7, N = 27). The only count lower than 13 is a single 8. All have posteriorly displaced dorsolateral folds.

Some of these are from altitudes considerably higher than

previously recorded.

Scaphiopus couchii Baird. 11856, Güisamopa, mpio Sahuaripa, Sonora (28°39'9"N, 109°6'57.1"W), 671 m.

An adult is from within the known range of the species.

Smilisca baudinii (Duméril and Bibron). 11520, Milpillas, mpio Chínipas (27°12'9.7"N, 108°38'47.3"W), 1250 m; 11627-8, Valle de Tacupeto, Sonora (28°17'30.3"N, 109°17'10.9"W), 555 m.

All are adults. Those from Sonora are the northernmost recorded for Pacific slopes, by about 175 km; Guirocoba, Sonora, was the only locality in Chihuahua listed by Duellman (2001), and the only ones he listed for Chihuahua were 2.4 km SW Toquina and Riito.

Spea stagnalis (Cope). 11559, Unamichi, mpio Fronteras, Sonora (30°40'8.1"N, 109°58'56.1"W), 990 m; 11594, km 17, Creel-San Rafael, mpio Urique (17°40'42.7"N, 107°44'42.7"W), 2233 m.

The species is limited in Sonora to its NE corner.

Kinosternon integrum (LeConte). 11746, Milpillas (27°11'29.2"N, 108°38'38.2"W), 469 m; 11780, 11936, Chínipas and Ejido Santa Ana (27°23'39.9"N, 108°32'9.7"W), 469 m.

The straight-line carapace length in 11780 is 150 mm, of 11936 103 mm. No. 11746 is disarticulated. Six live specimens are from Rancho El Jordán (27°23'16.8"N, 108°32'39.6"W), 469 m.

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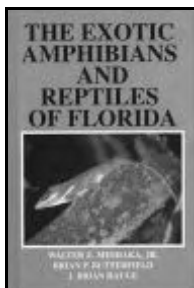
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Book Review: *The Exotic Amphibians and Reptiles of Florida* by Walter Meshaka, Jr., Brian Butterfield and J. Brian Hauge. 2004. 166 pp. Krieger Publishing Company. ISBN 1-57524-042-4. Hardbound. \$34.50

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As a child I dreamed of stalking the canals of Florida, collecting exotic herps and fish. Today I am more interested in the conservation issues created by the presence of these non-native animals. If you share either of these interests, *The Exotic Amphibians and Reptiles of Florida* is a book that belongs in your library. It presents a profile of every exotic herp species in Florida including maps and descriptions that aid the casual herp-watcher, and detailed natural history accounts and references for those who want to learn more.



The brief introduction establishes an important context for the species accounts. It describes herp colonization trends, beginning with the late 1800s to the present. These trends are illustrated by a useful map that shows the density of exotic herp species by county, as well as a graph that shows the alarming rate of increase of exotic herps in Florida.

The body of the book consists of species accounts. Three useful criteria must be met for a species account to be included in this section: a voucher record of the species, evidence of reproduction, and persistence of a colony for at least one complete generation. The 40 species that meet these criteria are discussed in detail. An additional 19 species that have been reported in Florida but did not meet the criteria are listed, along with notes discussing their status. All 59 species accounts include either literature citations or authoritative observations that establish the current status of the species. It is apparent that the authors spent considerable effort personally verifying the presence of most of these species. I would have liked to join in some of the herp hunts that are evident between the brief lines that state their observations.

The 40 main species accounts are packed with information and are divided into several sections that make finding information easy. Each account is headed by the scientific name and author as well as all common names. The next three sections give a general description of the species, note body size, and discuss similar species. Good photographs accompany each account but, for learning visual identification, a field guide will be useful too.

The next section of the species account, entitled "History of Introduction and Current Distribution," presents a brief but interesting picture of what is known about the dispersal history of each species, along with the pertinent references. This section also notes many of the ill-advised introduction events, such as the multiple, intentional introductions of the knight anole to southern Florida. A useful range map showing where

voucher records have been obtained also accompanies this section. For species that are common throughout a wide area, the map is shaded, otherwise only specific collection localities are indicated.

The next section, "Habitats and Habits," describes more than just where the species lives; it also describes what is known about how habitats are used. Notes on issues such as the effects of human-altered landscapes, inter- and intra-species competition, and foraging behavior are discussed, as appropriate for each species. The specific microhabitats are often noted—an important aid for those looking for a specific species. I especially enjoyed comparing how each of the introduced anole species used their respective habitats. Several of the exotic species in Florida are found only in extremely limited ranges on private property, so the authors emphasize the importance of respecting private property rights when herping.

The last three sections are "Reproduction," "Diet" and "Predators," again containing thoroughly referenced information. However, data on these topics often have not yet been gathered. The authors report on the data available and add their own observations. Still, for many species, it is often indicated that little is known about one or more of these aspects of its life cycle. It seems that many parts of the book, but these sections in particular, could stimulate interesting questions for field biologists to explore.

Following the main species accounts is the list of 19 species of uncertain status. The scientific name and author are listed, along with common names and a sentence or two noting its reported occurrences. Although these species are not yet considered established in Florida, they likely include the next species that will become established.

The glossary and cross-reference of scientific and common names makes this information-dense book easy for everyone to use. The 11 pages of references make it a convenient place for the professional to find citations of pertinent studies.

Although organized like a field guide, this book presents a series of clues to a much wider story that includes issues like habitat alteration, the pet industry, and public education. The afterword, by Dr. Meshaka, is a thoughtful discussion of such issues. The author succinctly describes how exotic herps arrive, disperse, and become established in Florida. He also presents a series of logical ideas to curtail the current trend of exotic invasion and range expansion, and to preserve the natural heritage of Florida. Although this discussion focuses on Florida, the concepts and ideas presented in the afterword could apply to any natural area. In his conclusion, Dr.

Meshaka states, "In my opinion, this book has done little if it hasn't both convincingly revealed human responsibility for this exotic species list and revealed the importance of knowing more about the lives of these species to deal more effectively with them. . . ." The book did do this for me and can do so for other amateur and professional herpetologists, too. On its own, it is an effective introduction to the issues surrounding

exotic invasions and an interesting overview of the herp species that have invaded Florida. As a reference, it is an important collection of data and an expedient source of references for exploring the issues in detail. Whether you are an amateur herper or a professional scientist, this book will be an interesting and valuable addition to a collection of books on regional herpetofauna.

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HerPET-POURRI

by Ellin Beltz

Now I have read everything

It's hard to find a "new" herp story but here's one: "[A motorist] was shell-shocked when a flying turtle crashed through his windshield on Interstate 95. `When I looked up, there was glass all over me and a turtle was sitting beside me in my van. It seemed like it happened in slow motion.'" Neither he nor the animal described as a one foot long "cooter box turtle" were seriously hurt. The turtle was clipped by a truck tire and flipped up into the air and through the motorist's windshield at a speed reported to be about seventy miles per hour. [*Chicago Sun-Times*, May 17, 2004, from MaryBeth Trilling]

And they've seen everything

Police officers in Philadelphia are pretty unshockable but they got a surprise when they saw a 3-foot long alligator riding in a black BMW, with its head hanging out the window like a dog. The owner was tearful when the animal was taken. Philadelphia law prevents private people from owning alligators. [WPVI Action News, Philadelphia, June 8, 2004, from Wes von Papineäu]

But we've heard this before

- Officials confiscated "stacks of glass and wire cages filled with rattlesnakes, vipers and one 15-foot Burmese python estimated to weigh between 140 and 160 pounds. . . . [The whole list of] other snakes removed Thursday included three gaboon vipers, a rhino viper, a bush viper, a timber rattlesnake, a western diamondback rattlesnake, an eastern diamondback rattlesnake, one South American rattlesnake, a spitting cobra and a South American pit viper, said . . . a reptile curator for the Dallas Zoo, where the venomous reptiles were taken," according to the *Fort Worth Star-Telegram*. The snake's owner was a tenant in the condominium where people had reported two loose cobras in March. One cobra was captured right away, the other one escaped all attempts at capture. A snake catcher said that some of the things that had been set out to catch the snake had been tampered with, which may have led authorities to search the condominium where the tenants were reported moving tanks in and out at night and keeping caged rabbits on the porch. [June 10, 2004, from Wes von Papineäu]

- Melbourne, Australia, police seized "thousands of dollars worth of exotic reptiles during a raid in Melbourne's south.

Detectives swooped on a Dandenong factory and found several rare snakes, including boa constrictors and a python. They also found several water dragons and about 80 Japanese newts. . . . [A spokesman said] police recovered more illegal reptiles than they anticipated. [June 2, 2004: Australian Broadcasting Corporation, May 31, 2004, from Wes von Papineäu and Raymond Hoser, *Sydney Herald-Sun News*]

- Red-eared sliders were the most common species of reptile turned in during a recent amnesty in Australia's Northern Territory. [Australian Broadcasting Corporation, May 31, 2004, from Wes von Papineäu]

Hopping to go home soon

Veterinarians at the Steve Irwin's Australia Zoo inserted a tiny pin in the hind leg of a treefrog in a delicate two-hour operation. The frog was injured in a screen door; the woman who brought it in was so distraught that zoo vets decided to try to save its life. "The frog . . . took to his hospital food of "pinkie mice" with such gusto he had gained an extra 9 grams over his admission weight of 50 grams. He even managed a premature escape attempt, . . . discovered clinging to a branch in a pile of koala leaf litter, 20 meters from his cage. . . . [The frog was certainly the hospital's] most unusual patient. . . . He would be released back into the wild when he was fully recovered and the surgical pin would probably be left in place. `He's hopping everywhere now,'" the vet said. [*Australian Courier-Mail*, June 11, 2004, from Wes von Papineäu]

Too much nutrient

According to researchers who have studied frog deformity issues in North America, increases in the numbers of ramshorn snails may be the culprit. They suggest that the numbers of deformities may be in on the increase because the snail is the host for a flatworm parasite *Ribeiroia ondatrae* which causes deformities in frogs including excess and misshapen limbs and the snail is undergoing an unprecedented population explosion due to "excess nutrient inputs into the ponds where [the snails live and] tadpoles develop," according to the July 2004 issue of *Ecology Letters*. [Blackwell Publishing Ltd. press release, June 10, 2004, from Wes von Papineäu]

Gucci-gucci gone

A saltwater crocodile nicknamed "Gucci" by people in Hong Kong has become something of a celebrity for eluding several

attempts at capture. It was first spotted last fall, went dormant over the winter and is now active again in a polluted creek where it was first seen. The croc has even been seen sun-bathing on top of traps set to catch it. The only ones to actually catch it so far are news photographers and media film crews. [May 1, 2004: *Miami Herald*, from Alan Rigerman and the *Wisconsin State Journal*, from J. Battaglia] One assumes the beast is called “Gucci” because up to now that’s the only kind of croc regularly seen in fashionable Hong Kong!

Life in the food chain

- Burmese pythons are frequently seen at Everglades National Park. Naturalists suspect people are letting their pets loose when they get too big to handle and also that they are breeding in the wild. “Twice in the past two years, visitors at popular boardwalks have watched as pythons battled alligators. Each time the alligator won and carried off the python in its mouth” reported the South Florida *Sun-Sentinel*. Rangers have shot a few pythons, too, but more continue to turn up. Since 1999, the U.S. has imported more than 144,000 Burmese pythons from Vietnam and other parts of SouthEast Asia. Only two known U.S. deaths are blamed on large constrictors: an 8-year-old girl in Pittsburgh and a Colorado man. Both deaths occurred in 2002. [May 13, 2004, from Alan Rigerman]
- A naturalist at a Hialeah, Florida, park said that crocodiles are coming ashore in the park to eat ducks, “Unlike . . . claims regarding frightened families, I have seen them gathered around the lake in awe of this amazing creature. If having exotic waterfowl in our park creates a food source for these animals, and they are coming ashore on their own, then let it be. . . . The gardens are clearly marked as a crocodile area. . . . Unfortunately we have altered their habitat and their food source.” [*Miami NewTimes*, May 5, 2004, from Alan Rigerman] Among the waterfowl consumed has been a pair of black-necked swans, a mute swan and two European shel-ducks. Several people, including Alan, pointed out that releasing exotics, in this case waterfowl, is now not considered an environmentally friendly act and that the crocs may just be doing Florida Nature a great service. [*Miami NewTimes*, April 28, 2004]

Excitement in Iowa

“Albino alligators turn pink with excitement as they adjust to their new environment,” said the director of the Blank Park Zoo in Des Moines which was making a big deal about having a pink alligator. While most of the gator had faded to white after the first week, his face was still pinkish. The animal was acquired for an exhibit on albinism. [CNN.com, June 1, 2004, from Ms. G. E. Chow]

Good news for sea turtles

Regular readers of this column will recall reports from around the world of sea turtles infected with fibropapilloma virus which attacked their eyes, blinding them and preventing them from eating. While searching for a cure, many scientists have expressed concern that nothing could be done and that the turtles would all become infected. Several hundred of the worst infected are being maintained in captivity which of

course takes them from being agents of new infection in the wild. Researchers writing in the *Journal of Virology* suggest that *Ozobranchus* leeches common in and around turtles harbor the virus. Infected turtles do not spread the disease; only the infected leeches. Recently several infected turtles have gone into remission and the spread of the disease seems to have slowed. [*The Honolulu Advertiser*, June 1, 2004, from Ms. G. E. Chow and Paul Breese]

Frog Joke of the Month

Q - Why do frogs love baseball?

A - They’re great at catching flies.

[from MaryBeth Trilling]

15 minutes of stupidity

- A Florida preteen fought off an alligator attack after he decided to take a dip in gator-infested waters in Deltona. He got a couple of scratches on his head and one ear was nearly severed. Hearing of his “brush with death” and “miraculous survival” the news media went into a frenzy. He was on several morning shows, interviewed for major newspapers and a long interview for some gossip show was in the works. He said, “It’s like I’m famous now, like a movie star. It’s pretty cool.” Back at home, life goes on. A neighbor boy said, “Once they catch that gator, I’m going swimming again.” His mother said, “It’s Florida, you can’t keep your kids out of the water.” Two gators were later trapped and killed in Lake Diana. [Orlando, Florida, *Sentinel*, May 20 and 21, 2004, from Bill Burnett] I liked Bill’s note. He wrote: Anyone swimming in unsupervised lakes in Florida should expect and know there are gators. Want to swim? Get a pool! Best wishes! Bill
- “Two boys reportedly killed a snake in a Melrose [Oregon] barn . . . and then decided to light it on fire with gasoline, catching some pallets and weeds outside the barn on fire. A mother of one of the boys, who were 14 and 11 years old, called 911 . . . after she saw the fire in the barn. . . . Firefighters responded to the incident. . . . The boys managed to put out the fire with a couple of buckets of water before they arrived. No citations or other official action was taken because this is the first such incident for either of the boys. . . .” [Douglas County, *Oregon News Review*, June 10, 2004]

Two years for copperhead

This story seems to have dragged on for a while, but the man and his son who mailed a live venomous snake to an enemy have been sentenced. The father lost his law license and his law firm, and will spend two years in jail. The son is about to turn 21 and earned 60 months in jail due to prior convictions and two arrests since when he was arrested for mailing the snake. Their trial had gone on for a week when the two changed their minds and pled guilty. [*Arkansas Democrat-Gazette*, April 24, 2004, from Bill Burnett]

Aloha!

I didn’t know this, but Paul Breese pointed out that it was the late Sean McKeown who suggested using citric acid spray to reduce unwanted frogs, like coquis, in Hawai’i. He sent a

clipping of a company that does coqui frog spraying; one of those people who will make lemonade from citric acid, I suppose. Paul wrote a lovely letter where he pointed out that this season was “snake weather” in San Diego where he grew up. Well it’s snake weather here in Ferndale, too, where happy and quite pregnant garter snakes cavort in our overlong grass and heat themselves up under a rubbish can lid we’ve hidden under a thin veneer of compost. The neighbors have told me they “hate snakes” and that they wouldn’t even think about buying our house because the porch and front walk are just “infested” with garter snakes. And to answer your question, Paul, no I don’t have a copy of that book.

Total ecosystem cost

- A U.S. Congressman from Hawai’i has asked for \$7 million to fight invasive species including Caribbean treefrogs. The bulk of the money would be used to fund U.S. Fish and Wildlife initiatives, some would go to state and county agencies. [*Kona Today*, April 26, 2004, from Paul Breese]
- Brown anoles, *Anolis sagrei*, are now being found on the Hawai’ian island of O’ahu, reportedly supplanting common green anoles, *Anolis carolinensis*, which were formerly widespread. Both lizards are introduced in Hawai’i. The brown anole is considered more aggressive than the green anoles which it is outcompeting and displacing on the windward side of O’ahu. The knight anole, *Anolis equestris*, has also become naturalized and is a serious concern to native fauna as it can grow to two feet long. Keeping any anole is illegal in Hawai’i. [*The Honolulu Advertiser*, May 30, 2004, from Ms. G. E. Chow]
- Four Madagascar giant day geckos were caught in Manoa, O’ahu and officials worried that another non-native and hungry species may become established in the “wild.” The latest find follows a string of reptile problems. “On May 21, Department of Agriculture inspectors confiscated a 4-foot albino king snake and a foot-long collared lizard at a Hawai’i Kai home. On May 28, a Honolulu Zoo employee found a cardboard box containing two snakes on his doorstep, presumably left by a pet owner trying to surrender them to authorities,” according to the *Honolulu Advertiser*. [June 3, 2004, from Ms. G. E. Chow.]

Venomous snakebite info online

For more information on snakebites and their treatment, visit the U.S. Food & Drug Administration website: http://www.fda.gov/fdac/features/995_snakes.html

Thank heavens it wasn’t pregnant

A 10-year-old African bullfrog escaped from its Daytona Beach, Florida, home in November. It wasn’t in its cage, it was having a “fresh air break” and hopped away. Its owner found her on the street near her home in June coming back from the supermarket. Her owner said, “It’s just kind of neat that she came back to me. It’s just amazing, unbelievable.” [Daytona Beach, Florida *News-Journal*, June 4, 2004, from Wes von Papineäu]

Two salamander tales from the Newt

- “Striking a deer on a rural road is always a concern for area drivers, but those who use Beekman Road have something else to worry about: squashing a salamander on its way to breed. In response to the unique situation, the township has placed signs on Beekman Road warning motorists to watch out for the creatures, which are about 6 inches long and blend in with the road because of their black color. In fact, the township closed the road to all but local traffic for two days in early March in order to allow salamanders and other amphibians to cross the road and reach vernal pools in the woods. [East Brunswick, New Jersey, *Sentinel*, June 3, 2004, from Wes von Papineäu]
- ““They say that under every 40 rocks in New England there is a red-backed salamander,`” said [the leader of] . . . a nature walk in the woods in Chester. . . . [She] found the first one after lifting up about 15 rocks in the forest. [A] six-year-old [participant] . . . found two red-backed salamanders under one rock about a minute later.” [Rutland, Vermont, *Herald*, June 7, 2004, from Wes von Papineäu] Looks more like a 3/16 ratio than a 1/40 to me.

Planting rattlesnakes?

Visitors to Kanopolis State Park have been seeing western diamondback rattlesnakes, which are not native to that part of Kansas. `This is not herd migration stuff,’ said herpetologist Joseph Collins, who works with the Kansas Biological Survey at the University of Kansas. `It’s possible someone is systematically turning them loose year after year.’ No visitors have yet been bitten by the western diamondbacks at the park, which is located about 30 miles southwest of Salina in central Kansas and draws about 280,000 people each year. But a worker at the University of Kansas lost a finger to one about five years ago. . . . Since a dead diamondback was found at the park in 1993, the first recorded sighting there, four live snakes have been captured there. There have been another 10 sightings of live snakes. State law prohibits the release of any exotic animal into the wild, and the Kansas Department of Wildlife and Parks is considering a ban on bringing western diamondbacks into the state. [KMBC 5, Kansas City, Missouri, June 2, from Wes von Papineäu]

Just eat cow

French police have smashed another frog poaching ring in France where local “gourmands” claim they can tell local frogs from legally imported frog legs. Restaurateurs contract with frog poachers to provide the now regulated French frog leg. [*Independent*, London, U.K., May 30, 2004, from Wes von Papineäu]

Count quickly!

“The first time John Lynch was kidnapped by leftist rebels, he was held in a wooden cage and threatened with execution. The second time he was forced to march five hours through bone-chilling rain before eventually being released. Lynch, who grew up in Illinois, is not one of the hundreds of U.S. military trainers and contractors helping the Colombian government battle powerful insurgencies and drug lords. . . . [Frog expert Lynch is] a University of Illinois graduate who teaches at the

Institute of Natural Sciences in Bogota, Colombia's capital. . . . [All over the world] Lynch and other scientists are braving grave dangers to carry out important research and conservation in one of the most hazardous yet ecologically diverse places on Earth. . . . A specialist in spiders, scorpions and insects at the Institute of Natural Sciences, said he avoids more than half the country. . . . A bat and mammal specialist at the same institute also said his research is hampered by the war. . . . [To try to reduce the danger] Lynch hires local residents to cook and do other jobs on research projects. He said the residents often are linked to the armed groups and can see for themselves that the researchers are not military spies. But because of a mix-up, Lynch said the rebels had not been informed of his presence before his two kidnappings, the first in 1999 and the second a year later. In each case, Lynch was released after several days once the guerrillas verified that he and his colleagues were scientists. In the first instance, Lynch said, the FARC guerrillas told him to keep the kidnapping a secret for a month or they would hunt him down and kill him. . . . `Colombia is the richest country in the world for

frogs,' said Lynch, who is credited with discovering several hundred new frog species in Colombia. . . . He has no intention of giving up his work. `I'm just much more careful,' he said." [*Chicago Tribune*, May 24, 2004, front page, from Mike Dloogatch]

Thanks to everyone who contributed this month and to Bradford Norman and Mrs. P. L. Beltz who sent stories I'd already used! You can contribute too, whether I use your story or not, your name will show up here. Take whole pages of newspapers and magazines with herp stories and fold a minimum number of times. Make sure your name is on each piece; those little address labels are great for this. And please be sure the name of the publication and the date of publication is on each piece. This month was bad for that; the Internet helps me find the citations, but I did have to put one article aside because I can't find its source. Mail to Ellin Beltz, P.O. Box 1125, Ferndale, CA 95536-1125. My E-mail is ebeltz@ebeltz.net and all the back issues of this column are archived on <http://ebeltz.net>.



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Herpetology 2004

In this column the editorial staff presents short abstracts of herpetological articles we have found of interest. This is not an attempt to summarize all of the research papers being published; it is an attempt to increase the reader's awareness of what herpetologists have been doing and publishing. The editor assumes full responsibility for any errors or misleading statements.

PROVENT-A-MITE™ TEST STUDY

M. J. Burridge et al. [2003, J. Herpetological Medicine and Surgery 13(4):16-19] studied the clinical effects of application of a permethrin acaricidal formulation, Provent-a-mite™, on three species of reptiles by direct application to African spurred tortoises, *Geochelone sulcata*, and by application to the bedding of rosy boas, *Lichanura trivirgata*, and green iguanas, *Iguana iguana*, using on each occasion ten times the recommended dosage every fifth day for a total of six applications. No evidence of toxic reactions related to treatment with the permethrin formulation was found in any of the three species of reptiles treated, suggesting that Provent-a-mite™ is a safe product to use as an acaricide for control of ticks on other species of tortoises, snakes and lizards.

A NEW MONTANE RATTLESNAKE FROM MICHOACÁN, MEXICO

J. Alvarado-Díaz and J. A. Campbell [2004, Herpetologica 60(2):281-286] describe *Crotalus tancitarensis*, a new species of rattlesnake from the upper elevations of Cerro Tancítaro in Michoacán, in the western portion of the Transverse Volcanic Cordillera. This diminutive rattlesnake appears to be most closely related to several species also occurring at high elevations in Mexico and the southwestern United States including *Crotalus intermedius*, *C. pricei*, and *C. transversus*. The Tancítaro species is most similar to *C. transversus*, but differs in aspects of scalation and color pattern.

SNAKE AGGREGATIONS UNDER COVER OBJECTS

P. T. Gregory [2004, Herpetologica 60(2):178-186] notes that use of cover objects for hiding is a well developed behavior in reptiles, including snakes. Snakes sometimes aggregate under cover objects, which may reflect a shortage of suitable cover, very favorable conditions, social attraction, or simply chance. However, most studies of aggregation behavior have been conducted in the laboratory. This study investigated the tendency of six species of snakes to aggregate under rocks in the field in southern Ontario, Canada. Most snakes under rocks were by themselves, but single- and mixed-species aggregations of up to four snakes were also found. Although all species were involved in mixed-species aggregations, not all possible combinations of species were found; no aggregations involved more than two species. Goodness-of-fit tests suggested that the pattern of aggregation sizes was well described by a geometric distribution, implying a nonrandom tendency toward aggregation. Nonetheless, because data were pooled over time, random occurrence of aggregation cannot be ruled out. However, aggregations were clearly nonrandom in another sense: individuals in aggregations tended to be the same size, perhaps indicating size-specific choice of rock and/or fellow snake. Careful field experimentation will be required to test these ideas.

DIETS OF FLAT-HEADED SNAKES

V. A. Cobb [2004, Copeia 2004(2):397-402] determined diet and prey size relationships for 68 individual flat-headed snakes (*Tantilla gracilis*) in the pine-hardwood forests of east Texas. Ninety-five percent of the snakes contained prey of which a large proportion was identifiable. Approximately 80% of the diet (by frequency) of *T. gracilis* consisted of coleopteran (beetle) larvae of the families Alleculidae, Elateridae, and Tenebrionidae. Other prey were centipedes and terrestrial snails. Correlation of prey size with snake size revealed a positive relationship, but accounts for little of the variation. Adults and juveniles ingested the same relative prey sizes with juvenile snakes predominately feeding on alleculid larvae and adults feeding on tenebrionid larvae. Larger snakes had a greater prey mass in their alimentary tracts; however, they did not consume significantly greater numbers of prey items. Direction of prey ingestion was primarily posterior first (72%). Because most of their prey have elongated bodies, it appears that *T. gracilis* responds to growth changes in body size by switching to different prey types. Choosing prey by size may be less important than prey shape for *T. gracilis* because of the morphological adaptations associated with a fossorial existence.

CAECILIANS FROM THAILAND

A. Kupfer and H. Müller [2004, Amphibia-Reptilia 25(1):87-97] report that the taxonomy of Southeast Asian ichthyophiid caecilians is largely in a woeful state. They give a new diagnosis for *Ichthyophis supachaii* from Thailand, based on a reexamination of the complete type series and recently collected material. The holotype is redescribed. The higher number of splenial than dentary teeth, a previously reported main diagnostic character of the taxon, is rejected. *Ichthyophis supachaii* follows the usual pattern of ichthyophiid caecilians in having more dentary than splenial teeth. Nevertheless, *Ichthyophis supachaii* is regarded as a valid taxon based on several morphometric and meristic characters. A detailed description of the male phallosome is provided.

BUSHMASTER SYSTEMATICS

D. S. Fernandes et al. [2004, Herpetologica 60(2):245-260] partitioned the genus *Lachesis* into six geographic groups to evaluate the taxonomic status and phylogenetic relationships among these groups. Characters of external morphology and hemipenial anatomy were evaluated. Results obtained through the phylogenetic and statistical analyses support recognition of the Central American *L. melanocephala* and *L. stenophrys* as distinct species, whereas the South American *L. muta* is recognized as monotypic, without further differentiation in subspecies. These results provide further evidence of the independence of the Central American and South American lineages and are congruent with other studies based on molecular data.

COASTAL GOANNAS AS SEA TURTLE EXPLOITERS

S. J. Blamires [2004, *Copeia* 2004(2):370-377] assessed the habitat of a population of coastal goannas (*Varanus panoptes*) at Fog Bay, Australia, by a combination of scat analysis, radio tracking, burrow counts, and sightings. Tracks were followed to assess spatial and temporal beach use. Scat analyses showed that goannas ate a variety of prey from the beach and dunes. Sea turtle eggs were the dominant prey found in scats during the dry season. All four census methods showed that goannas selected the beach habitat and dunes, although habitat selection indices were highest for the beach. Goannas used the beach throughout the year with peak beach activity occurring in May and November. There was no indication that sea turtle nesting influenced the timing of beach activities or how long goannas spent on the beach. The seasonal activity patterns of *V. panoptes* at Fog Bay is unlike *V. panoptes* in other areas and appears to be related to food availability. Although goannas prey on a large portion of sea turtle nests on the Fog Bay mainland, more research is required on the demography of the sea turtles to assess whether this affects the size of the sea turtle populations.

WATER TRANSPORT BY THE SKIN IN TEXAS HORNED LIZARDS

W. C. Sherbrooke [2004, *Amphibia-Reptilia* 25(1):29-39] notes that capture of rainfall on skin surfaces and its transport via capillary channels between scales to the mouth for drinking has been documented in a few agamid (*Moloch* and *Phrynoscephalus*) and iguanid (*Phrynosoma* spp.) lizards. Associated behaviors include a postural stance and jaw motions. This experimental study documents that rate of jaw opening and closing cycles is positively correlated with rate of water delivery to lizards' backs and to gain in mass of lizards attributable to drinking. The mean mass of water that can be held by the interscalar, capillary-flow system is correlated with body size, smaller lizards holding a larger percentage of their body mass in the rain-harvesting system. Ingestion mechanisms for water flow from the integumental channels to the mouth surfaces for drinking are discussed, with note being made of the possible roles of a fold of skin at the jaw angle (at the postlabial scales) and tongue actions. Recent hatchlings exhibit rain-harvesting behavior, suggesting its innate nature.

NONDESTRUCTIVE TISSUE SAMPLING FOR AMPHIBIANS

N. Pidancier et al. [2003, *Herpetological Journal* 13(4): 175-178] describe a non-destructive DNA sampling method for genetic studies on amphibians using buccal swabs. The researchers assessed the quantity and quality of DNA collected in each species by amplifying a part of the cytochrome b gene (381-1060 bp) and microsatellite markers. Buccal swab sampling is a useful alternative method for DNA sampling for both mtDNA and nDNA markers in amphibians. However, only frozen storage allowed microsatellite genotyping. The authors conclude that this method could greatly increase the accessibility of genetic studies in small vertebrates and could be preferred in the field of conservation genetics.

ASIAN TURTLE CONSERVATION PRIORITIES

B. L. Stuart and J. Thorbjarnarson [2003, *Chelonian Conservation and Biology* 4(3):642-647] note that a recent conservation assessment by IUCN recognized half of the Asian tortoise and freshwater turtle species to be Endangered or Critically Endangered, primarily due to overexploitation for food and medicinal purposes. To prioritize where in Asia the most urgent attention toward conserving wild turtle populations may be needed, the authors used recently updated information to rank Asian countries according to the richness, endemism and threat level of their turtle faunas. The results of this biological analysis ranked China, Vietnam, Myanmar, and Indonesia as the top four priority countries in Asia for turtle conservation activities. China ranked highest in all three categories of richness, endemism and threat level.

FIRE SALAMANDER BROOD CHARACTERISTICS

R. Rebelo and M. H. Leclair [2003, *Herpetological Journal* 13(4):179-187] studied size at birth and brood size in ovoviviparous *Salamandra salamandra gallaica* and *S. s. crespoi* from areas differing in hydrological regime. Gravid females were maintained in open-air terraria until parturition was completed. Sizes of offspring at birth tended to be less variable in populations from mesic areas, and brood sizes (numbers of offspring) were larger in a population from a xeric site. Large sizes at birth, close to those observed in viviparous *S. s. bernardezi*, could not be attributed to cold climate, the risk of larval drift or short pond duration, but perhaps to competition or predation by conspecific larvae. Large and small larvae differed in time taken to reach metamorphosis, but not in size at metamorphosis. Females from the xeric site gave birth to large numbers of small larvae, mainly in small groups and on separate occasions. In the wild, this probably results in the dispersal of a female's offspring among several ponds.

WINTER AGGREGATIONS OF GREEN ANOLES

D. C. Bishop and A. C. Echternacht [2004, *Herpetologica* 60(2):168-177] note that the green anole (*Anolis carolinensis*, Sauria: Polychrotidae) is the only native member of the Neotropical genus in the United States, and can be found as far north as North Carolina and Tennessee. Green anoles remain active throughout the winter in Tennessee, a rare behavior for reptiles at this latitude (35° 34' N). In the Little Tennessee River population observed, individuals shift habitats in winter to a south-facing bluff where they aggregate in rock crevices at night and on cloudy days. The crevices provide thermal protection from air temperatures that routinely drop below freezing. Aggregations did not seem to provide any thermal benefits to lizards. Lizards emerged from the crevices when the sun illuminated their section of the bluff. The emergence order of lizards from a crevice was nonrandom; some lizards consistently emerged earlier than others. Position in the emergence sequence was determined by the depth of the lizard within the crevice, with shallow lizards emerging first. Lizards remained close to the same group of crevices throughout the entire winter and often returned to the same section of the bluff the following winter season.

TIGER SNAKE SCALE COUNTS

A. Fabien et al. [2004, *Amphibia–Reptilia* 25(1):9-17] note that large snakes usually possess a higher number of scales to cover their larger bodies and their larger heads. It has been suggested that a diet based on large prey items also favors the development of scale number because the skin would be more extensible and thus enable easier swallowing of voluminous prey. A recent study, however, suggested that although body size positively influences scale count in snakes, diet is probably unimportant. The authors took advantage of a natural experiment that separated two neighboring and genetically indistinguishable populations of tiger snakes (*Notechis scutatus*) in the vicinity of Perth, Western Australia. In one population, situated on a small coastal Island (Carnac Island), snakes feed primarily on seagull chicks (large prey). In the second population, located on the mainland (Herdsman Lake), snakes feed mostly on frogs (small prey). Carnac Island snakes possess more scales (labial and midbody rows) and larger relative jaw lengths compared with Herdsman Lake snakes. Although preliminary, these data suggest that tiger snakes, whose many populations show contrasted feeding habits, are suitable models to test the “dietary habits / scale count” hypothesis.

GREEN FROG BEHAVIOR

N. M. Gordon [2004, *Amphibia–Reptilia* 25(1):55-62] notes that the green frog, *Rana clamitans*, exhibits a resource defense mating strategy whereby males advertise for mates and defend territories along the shoreline of breeding ponds for periods up to several weeks. Because male green frogs may be energy-limited during the breeding season, the author tested the predictions that males provided with extra food would 1) have longer tenures on territories, 2) show reduced movement between territories (due to greater site specificity), and 3) expend more energy in calling and territory defense. These predictions were tested by supplementally feeding frogs and by conducting regular surveys of frog location and behavior over the course of the breeding season in a fenced-in pond. Results support the second prediction but do not support the first and third predictions. Supplementally-fed male green frogs moved less than half the distance of sham-fed males. Green frog males reduce foraging but do not increase activities associated with aggression and territorial defense when food resources are more abundant.

AMPHIBIAN DECLINES IN PUERTO RICO

P. A. Burrowes et al. [2004, *Herpetologica* 60(2):141-154] monitored 11 populations of eight species of *Eleutherodactylus* in Puerto Rico from 1989 through 2001. The authors determined relative abundance of active frogs along transects established in the Caribbean National Forest (El Yunque), Carite Forest, San Lorenzo, and in the vicinity of San Juan. Three species (*Eleutherodactylus karlschmidti*, *E. jasperi*, and *E. eneidae*) are presumed to be extinct and eight populations of six different species of endemic *Eleutherodactylus* are significantly declining at elevations above 400 m. Of the many suspected causes of amphibian declines around the world, the authors focused on climate change and disease. Temperature

and precipitation data from 1970 to 2000 were analyzed to determine the general pattern of oscillations and deviations that could be correlated with amphibian declines. A total of 106 tissues were examined, taken from museum specimens collected from 1961 to 1978 and from live frogs in 2000. Chytrid fungi were found in two species collected at El Yunque as early as 1976; this is the first report of chytrid fungus in the Caribbean. Analysis of weather data indicates a significant warming trend and an association between years with extended periods of drought and the decline of amphibians in Puerto Rico. The 1970s and 1990s, which represent the periods of amphibian extirpations and declines, were significantly drier than average. The authors suggest a possible synergistic interaction between drought and the pathological effect of the chytrid fungus on amphibian populations.

REDESCRIPTION OF *TRIMERESURUS CORNUTUS*

H.-W. Herrmann et al. [2004, *Herpetologica* 60(2):211-221] redescribe *Trimeresurus cornutus*, a species that has not been reported for more than half a century, based on a recently collected live specimen from the Annamite Mountains of Central Vietnam. Besides new data on the distribution and habitat, coloration and morphological data of the first known male of the species are compared with the type specimen and a third known specimen from North Vietnam. Male genital morphology is described and the systematic relationships of the species are analyzed using external morphology, hemipenial morphology and molecular data. A phylogenetic hypothesis, based on four mitochondrial genes, suggests that the species is most closely related to *Protobothrops jerdonii*. The external morphology and hemipenial morphology are consistent with this placement. Based on the few specimens available, *Protobothrops cornutus* comb. nov. exhibits a very patchy distribution, with an altitudinal range reaching from 150 to 2000 m.

AMPHIBIANS AND FISH STOCKING IN SPAIN

I. Martínez-Solano et al. [2003, *Herpetological Journal* 13(4):167-173] examined the effect of fish stocking practices on the populations of seven amphibian species in a montane area in the Sierra de Neila (north-central Spain). The authors compared values for amphibian species richness and amphibian densities between ponds where fish have been introduced and ponds where fish are absent. The results: (1) amphibian species richness was significantly lower in ponds where fish have been introduced; (2) contrasting patterns of pond occupancy by the different amphibian species: on the one hand, two out of seven species (*Bufo bufo* and *Rana perezi*) coexist with fish, whereas the other five species breed exclusively in ponds where fish are absent; (3) based on comparisons of presence/absence data for species present in the area in 1981, 1991 and 2001, the authors conclude that two amphibian species have suffered severe declines in the last decades. Presently, *Alytes obstetricans* is almost exclusively confined to a few fishless streams, whereas *Salamandra salamandra* appears to have been completely extirpated from the whole area. This local decline of *S. salamandra* seems to be general for the whole region of the Sistema Ibérico (North-central Spain). The possible role of fish stocking practices in these declines is discussed.

The Tympanum

The following letter, on CHS stationery and with the approval of the CHS Board of Directors, was sent to the Governor of Illinois last month.

Governor Rod Blagojevich
James R. Thompson Center, Floor 16
100 W Randolph
Chicago Il, 60601

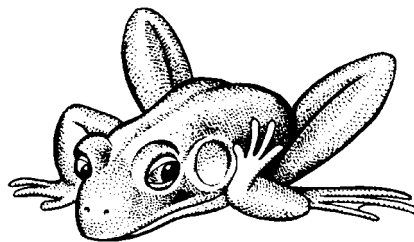
Honorable Governor Blagojevich,

The mission statement of the Chicago Herpetological Society includes promoting the conservation of all wildlife in general and amphibians and reptiles in particular. It is because of our mission and the personal concern of the members of our society that we are sending this letter to urge you to reconsider the elimination of fiscal year 2005 funding for the Natural Areas Acquisition Fund as well as the Open Space Land Acquisition and Development Program.

The Natural Areas Acquisition Fund (NAAF) and the Open Space Land Acquisition and Development Program (OSLAD) receive monies through a dedicated portion of the revenues from the Real Estate Transfer Tax. This revenue should continue to be used as intended by the state legislature and not added to the state's general fund.

Some specific areas of concern:

We strongly oppose any layoffs or elimination of staff currently funded by NAAF. Natural areas and endangered resources currently under state possession or control need constant supervision and maintenance to protect the land and wildlife from encroachment by alien species, poaching and other illegal activities.



We strongly oppose any actions to dissolve or temporarily suspend functions of the Illinois Nature Preserve Commission or the Illinois Endangered Species Protection Board. We will support measures to better utilize state monies such as teleconferencing for quarterly

meetings instead of face-to-face meetings and their associated travel costs.

Although we will support a temporary moratorium on natural areas acquisition through NAAF and OSLAD, we do so only so that the state can use monies not spent for acquisition on maintenance of existing land and resources. We do not support a permanent elimination of land acquisition funding.

The Natural Areas Association Conference will be held in Chicago this fall. This conference will be hosted by Illinois' natural area managers from many agencies and non-government groups, and it will be a national embarrassment to Illinois if the state has no dedicated employees left to attend the conference.

Wildlife will not wait to become threatened, endangered, or extinct until the state budget makers feel there is money available to fund conservation related staffing and initiatives.

This letter will be included in the next issue of the CHS *Bulletin*, which reaches over 300 members and their families in Illinois.

Sincerely, **Steve Spitzer, Corresponding Secretary**

Unofficial Minutes of the CHS Board Meeting, May 14, 2004

Lori King called the meeting to order at 7:31 P.M. Board member Ed Rzewnicki was absent.

Officers' Reports

Recording Secretary: Melanie Aspan read the minutes of the April 16 board meeting. Corrections were made and the minutes were accepted.

Treasurer: Jim Hoffman presented the April balance sheet and noted that the ReptileFest income is now included. Jim noted that the expenses relating to the signs purchased by Bob Bavirsha for ReptileFest have not yet been submitted to him. Jim also mentioned that he and Mike Dloogatch will be conferring on changes to the format of the balance sheet, and anyone else who would like to contribute ideas is welcome to participate.

Membership Secretary: Mike Dloogatch announced that it had been his sad duty to remove Roger Conant from the CHS

membership roster.

Committee Reports

Shows: Jenny Vollman presented June 5-6 and July 10-11 as the next weekend Notebaert shows. She also announced the dates for the Field Museum Members' Nights as June 2-4, 5-10 P.M. Lori King asked for volunteers for the outdoor "Science, It's Everywhere" festival at Jackson Park on May 22.

Monthly Raffle: Steve Spitzer announced that ZooMed has responded to our request for raffle items.

Library: Steve Sullivan told the Board that he has purchased two more new books for the library with the money allocated earlier this year.

Adoptions: Linda Malawy announced adoptions donations totaling \$495 since the March Board meeting.

General Meetings: The Herp of the Month for the May meeting will be Herps from Madagascar. There will be no Herp of the Month for June as it is the annual Show and Tell meeting. The Board decided that the category for July will be iguanids; August will be neonates/baby herps; and September will be rat snakes. The short presentation at May's meeting will be on mudpuppies and will be conducted by Jack Shoenfelder. Steve Spitzer agreed to be the emcee for June's Show and Tell.

Conservation: Steve Spitzer reminded everyone about the herp censuses that Ron Humbert will lead at various parks and preserves within Chicago on several weekends throughout May.

Chicago Wilderness: Jim Hoffman responded to the Board's inquiry from last month regarding last year's contribution to Chicago Wilderness. No contribution had been made. Mike Dloogatch made a motion to contribute \$100 this year. Linda Malawy seconded and the motion was passed with Jim Hoffman abstaining and all others in favor.

Old Business

State Reptile/Amphibian: Mike Dloogatch related that a live video conference is planned for the Illinois State Fair in Springfield on August 21 involving the voting. Live specimens

of all the proposed animals will be featured.

New Business

New Exhibit—2005: Lori King announced to the Board that Navy Pier is planning a temporary exhibit on crocodylians for a few months in 2005. Paul Sereno has contacted the CHS about participating, and a planning committee is being put together.

Round Table

Linda Malawy inquired if anyone else had heard about a ban on parrots as pets being incorporated into an Illinois farm bill.

Jim Hoffman mentioned that RodentPro has plans to offer a discount to CHS members on their merchandise.

Mike Dloogatch announced that Bibliomania has sent the CHS a check for the order that came in on the form passed out along with an offer to put different books onto the list.

Lori King extended a thank-you to all who participated in "Dinner With a Dinosaur."

The meeting was adjourned at 8:47 P.M.

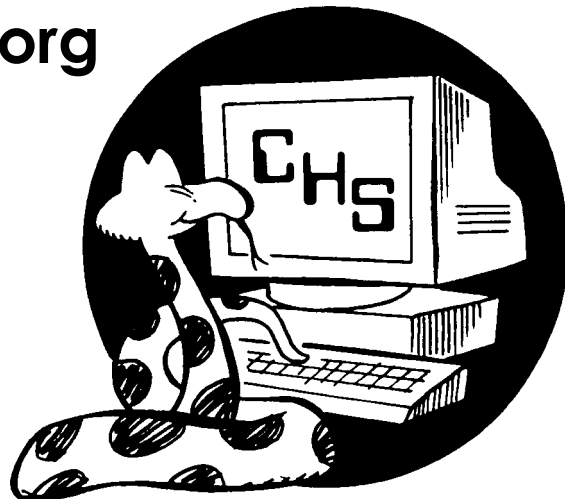
Respectfully submitted by Melanie Aspan, Recording Secretary.

Next time you surf the WorldWide Web, crawl, run, slither, slide, jump, or hop over to the CHS web site!

www.chicagoherp.org

You'll find:

- **Announcements**
- **CHS animal adoption service**
- **CHS events calendar & information**
- **Herp news**
- **Herp links**
- **Meeting/guest speaker information**
- **Photos of Illinois amphibians & reptiles**
- **Much, much more!**



Chicagoherp.org is accepting applications for banner advertisements or links from herpetoculturists and manufacturers of herp-related products. Visit the site and contact the webmaster for details on how you can sponsor CHS!

Advertisements

For sale: rats and mice—pinkies, fuzzies and adults. Quantity discounts. Please send a SASE for pricelist or call Bill Brant, *THE GOURMET RODENT*, 6115 SW 137th Avenue, Archer FL 32618, (352) 495-9024, E-mail: GrmtRodent@aol.com.

For sale: from **The Mouse Factory**, producing superior quality, frozen feeder mice and rats. We feed our colony a nutritionally balanced diet of rodent chow, formulated especially for us, and four types of natural whole grains and seeds. Mice starting from: pinks, \$.17 each; fuzzies, \$.24 each; hoppers, \$.30 each; weanling, \$.42; adult, \$.48. Rats: starting with pinks at \$.45 each, to XL at \$1.80 each. Discount prices available. We accept Visa, MC, Discover or money orders. PO Box 85, Alpine TX 79831. Call **toll-free** at (800) 720-0076 or visit our website: < <http://www.themousefactory.com>> .

For sale: **high quality frozen feeders**. Over a decade of production and supply. Seven sizes of mice available: small newborn pinks up to jumbo adults. Prices start at \$25 per 100. Feeders are separate in the resealable bag, not frozen together. Low shipping rates. Free price list. Kelly Haller, 4236 SE 25th Street, Topeka KS 66605, (913) 234-3358 evenings and weekends.

For sale: Herpetology of Western Australia. 5 volumes. #1 Frogs (1984) by Tyler, Smith, Johnstone; 109 pp. #2 Skinks (1981) by Storr, Smith, Johnstone; 200 pp. #3 Geckos & Pygopods (1990) by Storr, Smith, Johnstone; 141 pp. #4 Dragons and Monitors (1983) by Storr, Smith, Johnstone; 114 pp. #5 Snakes (1986) by Storr, Smith, Johnstone; 187 pp. Total of more than 750 pages. All volumes are soft-cover, with color front. Each is profusely illustrated with color photographs. Condition of books like new, absolutely superb. Sold as a set only = \$285. Contact Karl Switak, E-mail: khs@sonic.net.

For sale: herp books. *Natural History of Cottonmouth Moccasin*, *Agkistrodon piscivorus*, by Ray D. Burkett, 1966, pp. 437-491, 13 tables, 5 figs., softbound, \$26; *Natural History of the Hognose Snakes*, *Heterodon platyrhinos and Heterodon nasicus*, by Dwight R. Platt, 1969, pp. 255-420, 7 b&w plates, tables and figs., softbound, \$32; (Both of these were published by the University of Kansas.) *Frogs of the Northern Territory* by Michael Tyler and Margaret Davies, 1986, 77 pp., 49 color photos, 38 figs. (mostly range maps), keys, softbound, \$21; *The Last of the Ruling Reptiles* by Wilfred T. Neil, 1971, 486 pp., 162 figs., comprehensive reference, DJ, hardbound, \$98; *Australian Reptiles in Colour* by Harold Cogger, 1967, 112 pp., 50 excellent color photos of reptiles in their natural habitat, somewhat tattered DJ, hardbound, \$15. All books in excellent condition except as noted. Send E-mail address for complete list. Orders for \$25 or more sent postpaid; \$2.50 postage and handling for orders under \$25. William R. Turner, 7395 S. Downing Circle West, Littleton, CO 80122, (303) 795-5128. E-mail: toursbyturner@aol.com.

For sale: c.b. '03 yellow anacondas, aggressive feeders, perfect health, about 2' long, \$100 each; also c.b. '04 reticulated pythons; beautiful hatchlings already feeding on adult mice. These guys are tiger siblings and are available for \$100/each as well. Personal checks, money orders and Paypal accepted. Out of state shipping available. If you have questions or would like to purchase an animal call Mark Petros, (847) 836-9426 or E-mail ballpython777@yahoo.com.

Herp Tours: Why pay more? Travel with the International Fauna Society, a 501 (c)3 not-for-profit organization, and experience the Costa Rican rainforest! Stay at the beautiful Esquinas Rainforest Lodge in the untouched herpetological paradise that is Piedras Blancas National Park. Meet new friends, relax in the naturally-filtered swimming pool or in the lush, fauna-filled tropical garden. Discounts for IFS and Chicago Herp Society members. For details, visit The International Fauna Society website at www.faunasociety.org or E-mail: info@faunasociety.org.

Herp tours: Adventure trips to **Madagascar!** Journey somewhere truly unique to seek and photograph nature on the world's least-studied mini-continent. For maximum herp fun and discovery, join Bill Love as we go where few people will ever venture in their lives. Let his experience assure a comfortable tour finding the most colorful and bizarre species on the planet! Get all the details at Blue Chameleon Ventures' comprehensive new website: < <http://www.bluechameleon.org>> , E-mail: bill@bluechameleon.org, or call (239) 728-2390.

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Pet Sitting: In-home care for all your pets' needs. Specializing in reptiles, amphibians, birds, fish, dogs, cats. . . . Very passionate in herpetology, experienced vet technician at an exotic animal hospital, aquarium technician for over 10 years. Great references available. Call Lisa Collins to book your special care requests, (847) 644-3681. [Northshore based]

Reptile show: South East Wisconsin Exotic Reptile Festival—Racine, Wisconsin. August 1, 2004, 10–3. Adults, \$4; children under 12, \$1. Captive-bred only. South Hills Country Club, only an hour north of Chicago on I-94. Tables still available. www.sewefest.com. (262) 632-9129.

Wanted: Female ball pythons, adults preferred but smaller animals also considered. I am a professional breeder specializing in ball pythons and I can assure you that your animal will be provided with excellent care and optimal living conditions. Mark Petros, (847) 836-9426; ballpython777@yahoo.com.

Wanted: I'm looking for my soulmate. I want to settle down to a family before it is too late. But I have this problem. . . . When we get into hobbies and interests: old popular records, jazz and show tunes, and antique electronics are fine, but when I mention turtles, "What, are you crazy?" So maybe this is a better place to look. Please don't try to separate me from my turtles—at least not most of them. If interested, please drop a line to Ellis Jones, 1000 Dell, Northbrook IL 60062, telling a bit about yourself and giving a phone number.

Wanted: big-headed turtles; mata mata turtles; Mexican giant mud turtles (*Staurotypus triporcatus*); exceptionally large common snappers (45 lbs. & up); large alligator snappers (over 90 lbs.); spectacled caiman from Trinidad, Tobago and Surinam; dwarf caiman; smooth-fronted caiman; albino turtles (except red-eared sliders). Walt Loose, (610) 926-6028, 9:00 A.M. – 1:00 P.M. or after 11:30 P.M. Eastern Time.

Line ads in this publication are run free for CHS members — \$2 per line for nonmembers. Any ad may be refused at the discretion of the Editor. Submit ads to: Michael Dloogatch, 6048 N. Lawndale Avenue, Chicago IL 60659, (773) 588-0728 evening telephone, (312) 782-2868 fax, E-mail: MADadder0@aol.com.

UPCOMING MEETINGS

The next meeting of the Chicago Herpetological Society will be held at 7:30 P.M., Wednesday, June 30, at the Peggy Notebaert Nature Museum, Cannon Drive and Fullerton Parkway, in Chicago. This will be our popular and always well-attended annual **Show & Tell** meeting. Bring an animal that you find interesting for one reason or another and be prepared to give a short (under five minutes) presentation to the group. Don't be shy. Age (yours) or commonness (the animal's) should not be a limitation. Guidelines for the occasion: don't bring venomous reptiles or endangered species, and please bring only amphibians or reptiles (this means no worms, tarantulas or other invertebrates).

The regular monthly meetings of the Chicago Herpetological Society take place at Chicago's newest museum — the **Peggy Notebaert Nature Museum**. This beautiful new building is at Fullerton Parkway and Cannon Drive, directly across Fullerton from the Lincoln Park Zoo. Meetings are held the last Wednesday of each month, from 7:30 P.M. through 9:30 P.M. Parking is free on Cannon Drive. A plethora of CTA buses stop nearby.

Board of Directors Meeting

Are you interested in how the decisions are made that determine how the Chicago Herpetological Society runs? And would you like to have input into those decisions? If so, mark your calendar for the July 16 board meeting, to be held at the North Park Village Administration Building, 5801 North Pulaski Road, Chicago. To get there take the Edens Expressway, I-94, and exit at Peterson eastbound. Go a mile east to Pulaski, turn right and go south to the first traffic light. Turn left at the light into the North Park Village complex. At the entrance is a stop sign and a guardhouse. When you come to a second stop sign, the administration building is the large building ahead and to your left. There is a free parking lot behind the building.

The Chicago Turtle Club

The monthly meetings of the Chicago Turtle Club are informal; questions, children and animals are welcome. Meetings normally take place at the North Park Village Nature Center, 5801 N. Pulaski, in Chicago. Parking is free. For more info call Lisa Koester, (773) 508-0034, or visit the CTC website: <http://www.geocities.com/~chicagoturtle>.

HERP OF THE MONTH

Each monthly meeting will showcase a different herp. CHS members are urged to bring one specimen of the "Herp of the Month" to be judged against the entries from other CHS members. Prizes will be awarded to the top three winners as follows: 1st place—6 raffle tickets at next meeting; 2nd place—4 raffle tickets at next meeting; 3rd place—2 raffle tickets at next meeting. There will be no "Herp of the Month" in June because this is the Show & Tell meeting. The categories for the following three months are: July—iguanaid lizards; August—neonates/baby herps; September—ratsnakes.

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