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**An Experimental Outdoor Enclosure for Horned Lizards**

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**ABSTRACT:**

In March of 1999, study and husbandry of horned lizards was resumed (at my new residence) in Washington County, after a hiatus of approximately 20 years. This research has enjoyed a unique benefit by being centered in an area not too distant from the approximate confluence of the Great Basin, Mojave, and Sonoran Deserts. The altitude at the enclosure's location is about 2800' (just 600 feet higher than the mean altitude for Las Vegas, Nevada--some 120 miles distant, for comparison, and accordingly, on a given day, is about 5° F cooler). Hence, it is reasonable to assemble a number of xeric species of *Phrynosoma* without seriously disadvantaging any of them.

Altogether, 16 horned lizards representing 2 main species are currently under scrutiny. A grand piano-shaped outdoor enclosure comprising some 600 square feet houses them. A table follows setting forth certain data of interest for purposes of this presentation. Likewise, a scale drawing of the enclosure is appended for ease in following the full text of the presentation's narrative. The author has maintained literally hundreds of lizards in terraria during his lifetime. The success of the present outdoor enclosure for maintaining numerous individuals in a healthy if not robust condition, merits special attention. Adequate shade, water, a variety of vegetative cover and more solid refuges, and a constant supply of several ant species which emerge from a natural-looking orifice, are what the author attributes to this accomplishment. Regular surveillance and neighborhood vigilance so far have discouraged natural predators and domestic would-be predators from destroying the subject specimens. In closing, it must be said that the horned lizards normal habits in relation to temperature and nightfall in this not completely natural setting, have likewise contributed to their well-being.

**DISCUSSION:**

At present, 12 *Phrynosoma platyrhinos* are the focus of the on-going observations, although four adult *P. cornutum*, were recently legally acquired in Cochise County, Arizona pursuant to an out-of-state small game hunting license. Individual *P. hernandesi* have also sporadically been caught and released for purposes of making comparisons.<sup>1</sup>

All lizards included herein were "rescued" from novice hobbyists, on roads and road shoulders, or vacant lots in imminent danger of undergoing construction development. Each lizard was isolated temporarily in a 20 gallon glass terrarium for quarantine for parasites, and closer monitoring at the outset.

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<sup>1</sup> In Utah 3 of each horned lizard species occurring naturally within its boundaries may be possessed by each member of a family without a certificate of registration. No limit is imposed for non-native species. Accordingly, a neighborhood club has been organized so that more than three horned lizards can be studied simultaneously.

Most lizards were malnourished when captured, and therefore, required re-hydration via a small syringe before serious study could take place. The first six *P. platyrhinos* involved in the study (two adults, one sub-adult and three hatchlings) all survived the prior Winter's hibernation (1999/2000) exercise. Hatchlings were allowed to hibernate in a 10 gallon aquarium in the author's garage, and during warm intervals, were brought inside the house and fed primarily termites, small ants<sup>2</sup>, cockroaches, and administered water droplets, then fasted for a pair of days before being returned to the garage during any resumed cold spell. The sub-adult increased dramatically in size in the outdoor enclosure and reached sexual maturity during the 1999 Summer months. It, as well as, the two older adults merely burrowed a couple inches under the sand to pass the winter. Each of the three outdoor hibernators arose in turn within three weeks of one another during the Spring of 2000 when the author sprayed the enclosure with water on as many separate occasions. The adult male was discovered first (on March 11), the formerly sub-adult male was second to arise (on March 24) and the adult female (on April 4). All hatchlings were observed semi-active in their garage terrarium several weeks earlier. During the Spring of 2000 an additional six *P. platyrhinos* were introduced to the outdoor enclosure following similar procedures. On June 4, three adult female *P. cornutum* were introduced to the pen. All seemed to have experienced a relatively stress-free existence since introduction.

The enclosure is built of cinderblock and rests on a concrete foundation. A shade tree occupies the southwest corner and a Rainbird sprinkler the northeast corner. In the southeast and southwest corners artificial ant hills have been constructed by submerging a one gallon ,rinsed-out juice jug into the sand, and inserting one or more 1/8" diameter sticks which protrude from the opening so the ants can climb out. The lizards have accustomed themselves, depending upon preference, to frequent either one nest or the other at regular intervals. Often 5 or 6 horned lizards are found feasting in perfect harmony at the southwest "fake" ant hill where only *Pogonmyrmex rugosus* are admitted daily (usually at 7:30 AM, approximately 300 - 500 ants are poured into the container with a specially designed "ant-loader"<sup>3</sup>. After the previous stocking, if the ants are depleted they are replenished each day around 6:00 PM during the height of the Summer season.).

#### **ADVANTAGES:**

Outdoor enclosures save many hours wasted in commuting and locating via transmitters study specimens to be viewed in the field, ostensibly in their native habitat.

Outdoor enclosures can be constructed with wire mesh canopies not only to substantially retard predation by other reptiles, but to completely obviate feline and avian aggression..

Outdoor enclosures can be moisture adjusted, and regulated more closely for food intake, as well as, are more flexible for the establishment of refuges and microhabitats in relation to the setting sun, etc.

They are also more suitable for observation generally, not only because of convenience as aforesaid, but because the observer can hide to a certain extent and have a vantage point where he or she can video tape, study through binoculars, or allow associates to participate in the enjoyment of the reptiles without causing them much stress.

Outdoor enclosures eliminate a number of variables leading to more consistent data and the more rapid development of subsequent hypotheses.

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<sup>2</sup> *Dorymyrmex*, *Formica*, *Myrmecocystus* spp., *Solenopsis xyloni*

<sup>3</sup> Another juice jug which has been bisected around the circumference for ease in pouring the day's capture. Its nozzle is affixed to a length of PVC pipe which in turn is inserted into the buried jug. The procedure reminds one of a jet refueling mid-air...

## **CONCLUSIONS:**

Small cages are inhumane and should only be utilized temporarily for quarantine of adults as aforesaid, to assure selective mating, or to “beef up” an individual’s physical aspect prior removal to a more spacious outdoor enclosure. Hatchlings are able to withstand confinement better in terraria, but should also be set free at the earliest opportunity since natural sunlight and the ability to roam and associate with their larger counterparts, seems to improve their psychology, as evidenced by growth acceleration. Small cages can become unsanitary quickly and exacerbate panic and stress when one unwittingly introduces too many insects simultaneously--not just ants--at feeding times.

## **RECOMMENDATIONS:**

1. Use concrete footings at least 18” deep and cinderblock walls at least 2 1/2’ high to thwart escape and interference from the outside. Tin, glass, or ceramic tile may be siliconed to the block wall at approximately 2’ off the ground--certainly higher than any horned lizard can jump.

2. 3/4” Plywood rectangles resting on broken cinder block or large rocks can be effectively covered with sand to blend in, and weighted down with heavier rocks, so as not to blow away in the wind. These shelters from the heat may also provide a good place to lay eggs, as well as, escape other stresses such as the perceived threat of predation.

3. A variety of desert shrubs should be planted at irregular intervals to afford the horned lizards with abundant shade possibilities. Rock piles likewise should be strategically placed therein for warming up.

4. If a much larger enclosure<sup>4</sup> could be contrived, a blacktop trail would be ideal not only for wheelchairs, but to increase the chances of visibility by all invitees. Stepping stones should be laid for off trail requirements so as to obviate the risk of stepping on a lizard resting under the sand.

5. A complete canopy about 7-8’ off the ground would be desirable, coupled with enclosed chain link fencing on top of the cinderblock walls in order to afford maximum protection from roadrunners, ravens, hawks, large domestic cats, and canids.

6. Further study about the merits of man-made enclosures should be conducted in conjunction with a detailed nutritional analysis<sup>5</sup> so as to appreciate the interplay of diet and habitat in fostering healthy reproductives.

## **OTHER:**

Two *Cnemidophorus tigris* and at least one gravid female *Uta stansburiana* “dropped into” the enclosure, and are volunteer guests. A *Sceloporus graciosus* was appropriated during one of the author’s expeditions in search of *P. hernandesi*, and admitted to the enclosure at the end of April, but hasn’t been seen since. At least two presumed offspring of the side-blotched lizard are now observed foraging for small insects such as the aphids which infest the sunflower plants. The whiptails evidently find enough left over mealworms and other insects which make their way into the enclosure because they appear to be in robust condition.

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<sup>4</sup> Several acres, for example.

<sup>5</sup> The author has under preparation such a paper.