

Notes on the Captive husbandry of *Cruziohyla* Andrew Gray

Enclosure dimensions:

A size of 450mm x450mm x 600mm tall is an absolute minimum for 2 pairs of any adult *cruziohyla* frogs. Females appear to have no problems being housed together, although care should be taken when housing males together as they are territorial and will stress each other if maintained in larger numbers or enclosed confinement. Therefore, the density of males to the overall volume provided must be taken into consideration: Aggressive interactions and leg-waving warning behaviour between males is one sign to indicate males are stressed when together, even for short periods, where high humidity is present (<https://www.youtube.com/watch?v=8tWm8H0zT00>).

Furnishings:

In terms of structure, branches and live plants are essential for inclusion as they create selected resting sites. Broad, sturdy, almost horizontal-leaved plants, such as *Ficus elastica*, are especially preferred and appreciated by all 3 *cruziohyla* species. These frogs have adapted to naturally adhere to leaves so the leaves need to be large enough and strong enough to support the frog' across its whole body. As such, species such as *F. elastica* will nearly always be their choice of plant to sleep on during the day in captivity for most *cruziohyla*.

Substrate:

Being totally arboreal species, which in the wild never come down to the ground, I would suggest no natural substrate is required in any *cruziohyla* frogs' captive housing. These frogs treat flat surfaces (such as glass) in much the same way as the broad stable leaves they naturally sit on and adhere whilst sleeping in the understory. Some institutions maintaining these frogs do not use any substrates at all, rather using a false floor and mesh or glass with a drainage hole in the bottom with an automated water spray system, used to auto humidify and often auto clean the housing. Personally, I do not think this is a good way of maintaining *cruziohyla* frogs.



C. craspedopus. Large enclosure, simple set up, no substrate, dry area, wet capillary mat, spotlights & UV

Naturally, all *cruziohyla* live in the understory of tropical lowland forests, however in many of these areas, and particularly where *cruziohyla* prefer to sleep during the day, that area is often very dry. Unlike most other species of tree frog, apart from other leaf frogs, they are highly adapted to adhere to leaves in a specific way that retains moisture. They actually hate it and hide away from any direct rain in the wild, even breeding in the wild only occurs well after the rainfall has stopped, the day or so after rainfall.

Moisture and water requirement:

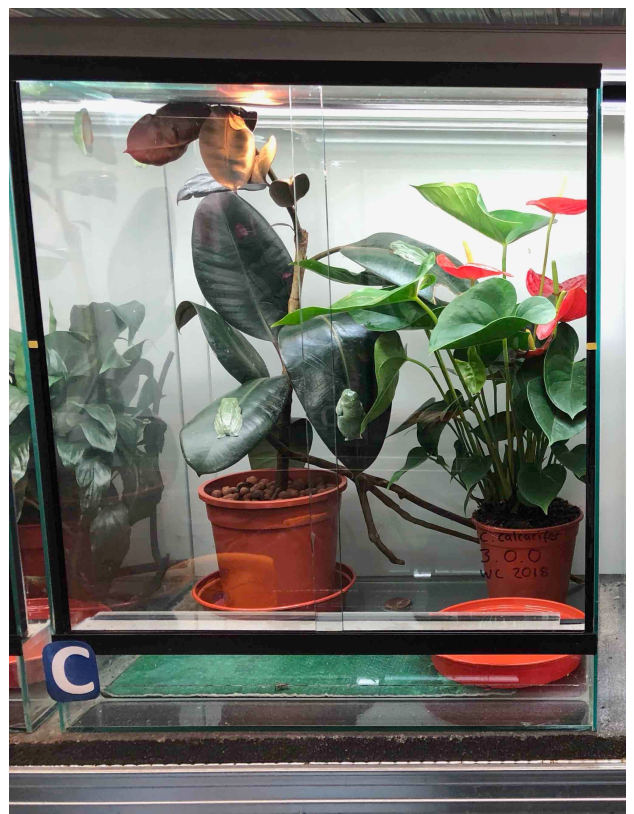
Although adapted to retain moisture from their dorsal surface, all members of *Cruziohyla*, as with *Agalychnis*, have highly permeable undersides which they use to soak up moisture from the leaves on which they sit. This is done directly after rainfall or humidity levels cause condensation on the leaves at night and is their natural way to hydrate. As such, rather than using an automated spray system I suggest not spraying these frogs at all during daylight hours is the best way to healthily maintain them. A light water spraying, by hand, once each evening as the lighting goes off, allows

for natural variation controlled by the keeper and is certainly enough. The frogs will then become active and also then hunt for food. If the ventilation is correct, the housing should retain the right level of humidity throughout the night and be dry again ready for the following day when the frogs need to sleep in relative dryness (50-70% humidity). As with agalychnis frogs, I also recommend always having a shallow but wide water bowl holding clean, dechlorinated water, always available. This should be replaced daily as if the frogs use it to hydrate in it at night they will automatically urinate in it. The urine is clear so cannot be detected and so it is always necessary to change it so as to be sure the water being provided is clean.

A further way to ensure these frogs are able to hydrate normally without over spraying the housing and too much humidity is to also provide either wet paper towelling on the flat bottom surface of the enclosure or use a piece of soaked capillary matting. The later is totally inert and ideal for soaking up and imparting moisture effectively. That is what is at Manchester Museum, and is cheap to buy, easily cleaned, totally reusable daily, and a good environmentally friendly material to use instead of throw away paper. This material is highly recommended and cruziohyla frogs use it effectively to hydrate naturally. Natural substrates, such as compost, coir, leaf litter should not be used in cruziohyla frog housings as these quickly become a breeding ground for spingtails, parasites, and harmful bacteria, which can quickly effect the health of the frogs, even by them eating prey items that have previously been hiding in the biomass of substate.

Ventilation and humidity:

Cruziohyla in captivity are best maintained in well-vented enclosures with some ventilation provided at low level as well as above. Approximately a third of the top is ventilated and can then be adjusted by covering further as required. A thin strip of ventilation at the front, at low level, provides airflow - the heat provided from the lights on the housing naturally draw in air from the low level ventilation as it rises. The front vent can also be adjusted to increase/decrease humidity levels when fine tuning the environment - Creating the correct conditions is a fine balance between finding the right heat, humidity, and ventilation. As a general rule, these frogs thrive in the conditions highlighted above as the norm and it should be noted that high levels of humidity or water spraying for a period has a negative effect on the frogs health - it replicate a breeding situation for these frogs, which is a stressful, active, and a highly energetic period in the wild, and it will lead to ill health. It is a mistake many keepers make with these animals but providing conditions that are too wet or humid for them in captivity, apart from when trying to reproduce the frogs, is not at all good for any cruziohyla species. Also, these frogs will breed readily if normally maintained in natural dry-day conditions when these are then changed for the breeding conditions.



C. calcarifer (note outward facing calcars and no lichen markings). Front ventilation of enclosure is further reduced with acrylic to provide slightly higher daytime humidity.

Heating:

I suggest ambient temperatures are provided generally rather than heating each housing individually to provide the a minimum background temperature required. All cruziohyla will do well at a temperature minimum of 22 degrees C (night 22-24 degrees). Lighting in the form of 2 sources (see below) is recommended to provide sufficient extra heat to lift the ambient temperature of 24 degrees to 27-28 degrees during the day and also provide sufficient UVa and UVb.

Lighting:

This is best achieved with a T5 UV tube, such as those available by Arcadia at 6%, as 12% UV tubes for these species is too strong. The reason for this is that in captivity the frogs typically sit on top of leaves and are often not shaded by them as they would be in the wild. In any case, they are not a canopy-dwelling genus, as many people think, but an understory frequenting genus. 12% UV tubes have previously proved to detrimentally effect the frogs' skin and their eyes: Unlike *Agalychnis* species, *Cruziohyala* have a clear eyelid that is not reticulated and 12% UV tubes can cause serious eye issues if the frogs sleep under them during the day. 6% tubes provide sufficient UVA and UVB for all *Cruziohyala* and so all 12% should be replaced for 6% so as not to damage the frogs' skin or eyes.



C. sylviae enclosure. Note small spotlights in top left & T5 tube (6% UV) over top vent. Plant: *Ficus elastica* plant used.

All three *Cruziohyala* species appear to appreciate the opportunity to have a temperature gradient associated with light within their enclosure during the day and specifically a small spotlight providing very localised light providing heat in one place. This is best achieved with a narrow focused small downlighter (50-70w) provided in one area within the housing.

Feeding:

Unlike many other tree frogs, *Cruziohyala* frogs are more of a sit and wait predator. In the wild, they frequent small territories in the trees where they live, apart from when breeding. They use the same specific leaves within their territories night after night on which to sit. In captivity they very rarely come down to feed at the bottom of the enclosure unless they feel it perhaps represents the horizontal surface of a leaf in their territory. Branches should be incorporated within their enclosures to enable food prey to climb within the frogs reach. These are important to provide, as are the correct levels of food. For example, if offered too many food items in captivity the frogs can soon become lazy and eventually their natural feeding responses will disappear. Some collections actually feed the specimens by hand, which again can soon result in these frogs losing their natural feeding instincts and if not then fed by hand will not revert to hunting for themselves in any decent capacity. I therefore do not recommend hand feeding or overfeeding the frogs in captivity as they can quickly become obese which can lead to health problems, lack of activity, mobility and thus lipidosis (fat deposits in the eyes seen in old captive specimens).

Diet:

Cruziohyala are entirely insectivorous and as such should be offered good quality invertebrates. Using gut-loaded crickets as a standard diet seems the best way of maintaining their good health in captivity. In terms of nutritional retention, gut loaded black crickets supposedly offers the best source and so are commonly used. However, some insects, such as adult black crickets, small roaches and locusts, can be difficult for the frogs to digest and can cause internal health problems and sometimes prolapses in *Cruziohyala* frogs. Rather, I recommend feeding well gut-loaded brown crickets as the main food source as these have proved to be a safe and highly successful food, particularly when the crickets are pre-fed carrots and natural bee pollen. At Manchester Museum, gut loading prey insects with bee pollen has proved essential in maintaining better frog health, colour, breeding success and longevity in *Cruziohyala*.



Feeding method:

Feeding regimes, sizes of prey, and amounts provided should vary, with some total fasting periods built in. The basic rule I find useful is no more than 12 food items per week and a break of at least 5-6 days per month. *Cruziohyla* frogs will eat fairly large sized prey items, so an adult frog should be fed the equivalent of no more than 3-4 crickets (approx 15- 20mm in size) two or three times a week. Variety and stimulation in the form of moths offered also keeps the frogs active and sharp, and also provides good behavioural enrichment. Feeding is done at the end of the day directly after the enclosure has been mist sprayed with water and the lighting has gone out. This ensures the frogs are active as well as their insect prey, which are dusted with calcium/vitamin powder prior to feeding in an ad ad-hoc fashion as it is not required each feed.

Variation in husbandry:

Husbandry variation between species of *Cruziohyla* varies only slightly: *C. sylviae* and *C. craspedopus* have almost identical husbandry requirements, as above; *C. calcarifer* requires humidity levels maintaining a little higher during the day and it is more active in hunting prey at night (Its behaviour is more similar to frogs of the genus *Agalychnis* than generally found in the other 2 *Cruziohyla* species).