citizen conservation

#Amphibians

Basic information and husbandry recommendations for *Ecnomiohyla valancifer*, Lichenose Fringe-limbed Treefrog

As of 11 October 2025 | *Ecnomiohyla valancifer* | Photo: Peter Janzen

Contents

1. Profile

Scientific Name: *Ecnomiohyla valancifer* (Firschein & Smith, 1956)
Common Names: Lichenose Fringe-limbed Treefrog, San Martín frilled tree frog, San Martín Fringe-Limbed Treefrog; Spanish: Rana voladora de San Martín, Rana de árbol de San Martín
Head-torso length: up to approx. 9 cm
CC#Amphibians-Category: II
Threat status according to the IUCN Red List: Critically Endangered (CR)
CITES protection status: no
EU protection status: no
Keeping facility: Relatively cool cloud forest terrarium with water section. Keep in pairs in terrariums measuring approx. 80 x 60 x 80 cm (length x width x height), group housing is also possible if necessary. Keep in a humid environment, but not in a classic warm and humid rain-forest terrarium; instead, keep at cooler temperatures of 20–24 °C during the day and 16–20 °C at night, cooler in winter. The tadpoles are raised in their parents' terrarium and are fed by the mother with nutrient-rich eggs. The young frogs are raised in separate breeding terrariums.
Required equipment: An artificial tree hollow filled with water is essential for reproduction. Otherwise, furnish with climbing branches and sturdy plants. Substrate: soil, which can be omitted for hygienic reasons or replaced with an aquarium filter mat. Simple basic lighting (fluorescent lamps or LED bars, with UV component if necessary), heating such as a heat panel, sprinkler system, nebuliser or atomiser for regular spraying, depending on the location. Remove faeces and debris as quickly as possible, using long tweezers or a spoon, for example.
Nutrition: Live invertebrate food animals such as crickets, cockroaches, grasshoppers, woodlice, etc., appropriate for the size of the frogs. Enhance the nutritional value of food animals by feeding them a rich diet and dusting them with calcium-vitamin powder. Feed 1–2 times a week. Tadpoles are usually fed by their mother with nutrient-rich eggs.

2. Why is *Ecnomiohyla valancifer* a Citizen Conservation species?

Without a conservation breeding programme, the Lichenose Fringe-limbed Treefrog is threatened with extinction.
| Sebastian Rohling

The known distribution area of *Ecnomiohyla valancifer* is limited to the slopes of a volcano and is extremely small, covering a maximum of 68 square kilometres. Although there are assumptions that the species also occurs in other locations, this has not yet been proven. This very small distribution around the active San Martín Tuxtla volcano (last eruption in the 17th century) already makes the species appear endangered per se, compounded by severe habitat destruction and degradation of the original cloud forest habitats. According to estimates by the International Union for Conservation of Nature (IUCN) Red List, the population trend is declining sharply, so that the species is classified as 'critically endangered' (CR) on its Red List in the highest threat category for species still living in the wild.

At least in the past, animals have also been collected illegally for the pet trade, albeit only in isolated cases. Since at least around 2015, the species has been available in European terrariums from unknown sources and is being continuously bred by a very small group of enthusiasts. The origin of the founding animals of this European population is unknown. Later, there was probably at least one second import to Europe, and isolated cases of keeping have also become known in the USA and Mexico.

For him, conservation breeding efforts came too late: *Ecnomiohyla rabborum* from Panama is presumed extinct in 2016. | Brian Gratwicke, Wikipeida-CC

Due to the acute risk of extinction in its natural habitat, the Citizen Conservation Advisory Board believes that establishing a coordinated ex situ population could be an important measure for the long-term conservation of the species. Without such coordination, as provided by CC, there is a risk that the species will accidentally disappear from captivity again, given the small number of keepers, e.g. because the population becomes overaged, the genetic diversity of the original animals is greatly reduced by untargeted breeding, or the animals are not transferred to further breeding programmes in time. Permanent, problem-free availability for private keeping also reduces the potential motivation for smuggling wild-caught animals from their country of origin.

Ecnomiohyla valancifer can also serve as an ambassador for the threat to amphibians in general and their natural habitat, the Central American cloud forests, which are under severe pressure. In addition, very little research has been done on this species to date. This also applies to other species of the genus *Ecnomiohyla*, some of which are also endangered. *E. valancifer* can therefore also contribute valuable insights into the conservation of these species as a 'surrogate species'. The knowledge gained so far from keeping *E. valancifer* in terrariums has already contributed significantly to expanding our understanding of these remarkable frogs. One of CC's goals is to gather further knowledge that is also relevant to species conservation.

The extraordinary reproductive biology, which first became known through observations in private terrariums, and other special features of this species are ideal for sparking people's interest in the diversity of amphibians and fostering understanding for this group of animals.

The importance of ex situ conservation breeding in species preservation can also be clearly demonstrated by this fringed-leg tree frog: the closely related species *Ecnomiohyla rabborum* from Panama is now considered extinct. Attempts to establish a conservation breeding programme for this species came too late. In the end, only one male remained at the Atlanta Botanical Garden in Georgia, USA, and no mate could be found. The frog, known as 'Toughie', died on 26 September 2016 – and with him, presumably, his entire species. The event attracted widespread media coverage around the world at the time. Citizen Conservation wants to help ensure that such a tragedy does not repeat itself with *Ecnomiohyla valancifer*.

3. Biology and conservation

3.1 Biology
- Systematics

The genus *Ecnomiohyla* belongs to the tree frogs (family Hylidae) and currently comprises twelve species. It was only established as a separate genus in 2005 by Faivovich et al. Previously, the species were considered part of the *Hyla tuberculosa* group. *E. miliaria*, described in 1886 as *Hypsiboas miliarius*, was designated as the type species for the genus.

The genus *Ecnomiohyla* is widespread in the humid tropical forests from southern Mexico through Central America to Colombia. Unfortunately, despite their size and striking appearance, very little is known about these frogs, mainly because they live hidden from humans in the forest canopy, but possibly also because they are so rare.

Ecnomiohyla valancifer was described in 1956 by Firschlein & Smith as *Hyla valancifer* and transferred to the genus Ecnomiohyla when it was established by Faivovich et al.

The type locality is: 'Volcán San Martín, 4500 ft., Veracruz, Mexico'.

The name '*valancifer*' is unusually derived from a Latinised English word: "valance" refers to a small decorative curtain or flounce, such as those attached to bed frames or armchairs to cover the legs or feet, or to curtain rods. The Latin suffix '-ifer' means 'bearing'. Freely translated, the scientific species name means 'the Ecnomiohyla with the decorative curtain', which refers to the striking fringes on its hind legs and arms.

Until recently, the Lichenose fringed-limb tree frog was largely unknown. | Christian Langner

Ecnomiohyla valancifer is only known from the higher elevations of the mountain slopes around the San Martín volcano, which are still covered with cloud forest. | Dongring, Wikipedia CC BY-SA 3.0

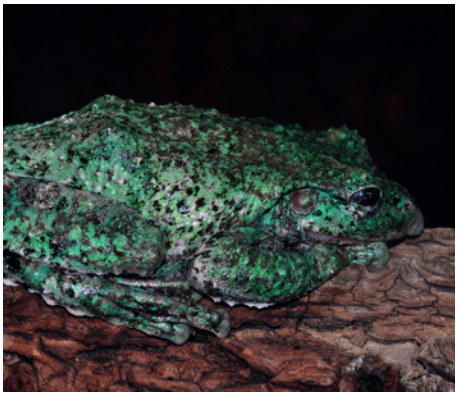
The Sierra de Los Tuxtlas is located in the south-east of Mexico. | Terpsichores, Wikipedia-CC BY-SA 3.0

- Distribution and habitat

The distribution area of *Ecnomiohyla valancifer* is the mountain cloud forests of the Sierra de Los Tuxtlas in the south of the Mexican state of Veracruz. The mountain range runs diagonally from north-west to south-east and is formed by a series of volcanoes. The highest are the San Martín and Santa Marta volcanoes, both of which reach an altitude of 1,650 metres. Between the volcanoes lies Lake Catemaco, the fourth largest lake in Mexico.

According to the literature, the animals have so far been found at altitudes of 500–1,180 metres above sea level. However, it is highly doubtful that the species actually occurs at the lower end of this altitude range; these are most likely incorrect assignments or records. It can be assumed that the species only occurs at relatively high altitudes, presumably above 1,000 metres above sea level, with reliable evidence coming from the area around 1,200 metres.

Annual precipitation in the region is 3,000–4,500 mm, locally even higher in some areas. Possible further locations are being discussed, but have not yet been confirmed. Overall, the species is hardly known in the wild. Only a few isolated specimens have been scientifically documented and studied.



The colour can vary between greenish … | Peter Janzen

… brownish … | Sandra Honigs

… and greyish. | Philipp Ginal

- Description

Ecnomiohyla valancifer is a large, powerful tree frog that reaches a head-torso length of 8–10 cm, averaging around 9 cm. Its physique is typical of a tree frog, with large, prominent eyes. The strongly pronounced webbing on its hands and feet is striking; it aids gliding flights or at least long jumps in the canopy of trees, allowing the frog to steer or brake its jump more effectively. A more or less pronounced ability to glide is known to exist in a whole range of tree frogs inhabiting the canopy. The webbing also seems to play an important role in reproductive biology, in attaching eggs and in supporting brood care.

Also striking are the fleshy fringes at the edges of the legs and arms, which give the animal its name and serve to break up its outline for better camouflage, as well as the significantly enlarged, round toe ends, which act like suction cups to provide the climbing animals with a secure grip. The skin is covered with numerous small tubercles and is only largely smooth on the belly.

The colouring depends on the environment and light intensity; the frogs have the ability to change colour. The animals have a green to greyish or brownish base colouring, which is marbled with darker elements. In brighter light, they appear more greenish.

Distinguishing features from closely related and sometimes very similar other *Ecnomiohyla* species are highlighted in Mendelson et al. (2015) and Köhler (2011), but discrepancies have been noted.

Pair of *Ecnomiohyla valancifer*; the male has strikingly powerful upper arms. | Philipp Ginal

Ecnomiohyla valancifer is a tree cavity dweller. | Peter Janzen

During the day, the nocturnal frogs sleep. | Peter Janzen

- Sexual dimorphism

The sexes do not differ in size or colouring (contrary to what is stated in the literature, where males are described as larger, which is not consistent with observations in the terrarium). However, males have significantly thicker arms, slightly smoother skin on their backs and a pronounced 'front thumb' (prepollex), which is also used as a weapon against conspecifics or attackers. The sex of adult animals is therefore relatively easy to determine with certainty.

- Wildlife

The nocturnal frogs live in the canopy region of the cloud forests. In any case, they are very rarely found, and the few sightings have been at heights of several metres. Pineda et al. (2020) and several other earlier authors have suggested that the tadpoles live in streams. Mendelson et al. (2015) consider this highly unlikely, given that most closely related *Ecnomiohyla* species reproduce in tree hollows. Terrarium observations to date also suggest that egg laying and larval development in most species takes place in water-filled tree cavities. Direct observation of reproduction in the wild or of the tadpoles has not yet been successful.

Virtually nothing is known about their natural habitat behaviour. Current knowledge about their reproductive biology is based on observations in terrariums. This underlines the importance of ex situ conservation of these frogs, as it is particularly important to gather knowledge about the biology of species threatened with extinction.

3.2 Endangerment status

Ecnomiohyla valancifer is listed on the IUCN Red List in the highest threat category for species still living in the wild as 'critically endangered'. | Sandra Honigs

As mentioned at the outset, the very small distribution area already poses a certain threat. However, the decisive factor for the threat is the already advanced destruction and fragmentation of habitats (Pineda et al. 2020; Solórzano García et al. 2012; Mendoza et al. 2005). Especially below 1,000 metres, the region's cloud forests continue to be converted into farmland and arable land. In addition, there is local logging and the collection of plants.

Rainforests throughout Central and South America are under severe pressure from deforestation, slash-and-burn farming, conversion to agricultural land and urban sprawl. This is particularly true of the often small-scale cloud forests. As tree-dwelling species, the fringed-leg frogs of the genus *Ecnomiohyla* are particularly affected. Three of the twelve species (*E. echinata, E. rabborum* and *E. valancifer*) are classified as 'critically endangered' by the IUCN, one (*E. salvaje*) as 'endangered' , three (*E. fimbrimembra, E. minera, E. veraguensis*) as 'vulnerable', one as 'near threatened' (*E. bailarina*) and two (*E. phatasmagoria, E. thysanota*) as 'data deficient', meaning that there is insufficient information available to assess the degree of threat. Only *E. sukia* is considered 'Least Concern'.

3.3 Conservation efforts

In the Los Tuxtlas Biosphere Reserve: Lake Catemaco with the volcanic mountains of the Sierra de los Tuxtlas in the background | Alejandro TamaresGarcia, Wikipedia-CC BY-SA 3.0

Part of the distribution area lies within the Los Tuxtlas Biosphere Reserve and is therefore subject to a certain degree of state protection. Nevertheless, the rate of deforestation is relatively high here too, and the remaining forest areas are highly fragmented (Pineda et al. 2020; Solórzano García et al. 2012; Mendoza et al. 2005). Pineda et al. (2020) recommend intensifying protection and improving management of the Reserva de la Biósfera Los Tuxtlas, as well as extending the protected area to other remaining cloud forest areas in the region and reforesting already degraded areas.

They particularly emphasise the need for further research to obtain information about the species and call for the creation of a species management plan. *Ecnomiohyla valancifer* is protected under Mexican law (category 'specially protected'), meaning that the frogs cannot be collected legally. A permit is required for their export from Mexico.

4. Keeping

The Lichenose Fringe-limbed Treefrog is a large, strong and robust tree frog. Large terrariums are required for its care and breeding, which must not be too warm and must imitate a tree hollow filled with water. If these somewhat special conditions are met, care and breeding are relatively unproblematic.

The terrariums can be attractively planted and designed, making them suitable as display terrariums. However, due to their nocturnal lifestyle, the frogs are mostly only seen sleeping during the day. At night, they present themselves as attractive tree frogs that are clearly visible in the terrarium. Particularly fascinating is the unusual reproductive biology of this species, but also their defensive capabilities, their distinctive camouflage with contour-dissolving fringes and skin tubercles, their colour change and their lifestyle as tree-top dwellers.

The Allwetterzoo Münster is also participating in Citizen Conservation's conservation breeding network. *Ecnomiohyla valancifer* is kept at its species conservation campus, and the findings from this have been incorporated into these keeping recommendations. | Sebastian Rohling

Ecnomiohyla valancifer has been kept in international terrariums since around 2015. The first breeding successes are thanks to CC advisory board member Karl-Heinz Jungfer. Together with other dedicated frog keepers from the Anura Working Group of the German Society for Herpetology and Terrarium Science (DGHT), he has succeeded in further breeding the species and gathering knowledge about the animals. The origin and number of the original animals in European terrarium keeping is unknown; presumably only a few individual animals were exported from Mexico. Jungfer found his first animals under a false name, declared as *Fejhyla*, at a terrarium keeping exchange. Around 2015, *E. valancifer* was also offered in Japan and France.

The information provided in these husbandry recommendations is based on the findings and experience of Karl-Heinz Jungfer, Philipp Ginal, Wuppertal Zoo (Dominik Fischer) and Münster All-Weather Zoo (Christian Langner, Kristina Theobald, Philipp Wagner).

Parts of these recommendations were contributed by Philipp Ginal and Karl-Heinz Jungfer. Basic terrarium knowledge is required for participation in CC and must be demonstrated to the CC office before taking on the animals, either through formal certification, such as that offered by DGHT/VDA Sachkunde GbR, or by communicating previous terrarium experience and knowledge to the CC office. Such basic knowledge is therefore not covered in our husbandry recommendations.

In principle, the provisions of the general CC guidelines and the boarding agreement apply to all CC animals.

4.1 Requirements and documentation obligations

Ecnomiohyla valancifer is not protected by international agreements, the species is not covered by the EU Species Protection Regulation, and keeping it in Germany does not require notification or authorisation. Of course, the basic legal provisions for keeping animals must be observed locally, as these may vary from country to country. In Germany, for example, these are the basic provisions of the Animal Welfare Act, which apply to the keeping of all animals..

At CC, keepers always receive the animals with a certificate of origin. Accordingly, when handing over their animals, CC breeders must ensure that they complete and sign the 'Certificate of Origin and Transfer' form provided by CC. This form should not only indicate the origin of the offspring's parents, but also that of the parents' parents. This ensures complete documentation. Even though this is not required by law, it facilitates the coordination of conservation breeding and proves legal ownership should the species later be placed under protection. All documents relating to transfers within CC or from CC must be emailed immediately as a scan or photo to the CC office (amphibians@citizen-conservation.org). Please observe this rule, as otherwise the CC office will have to make enquiries, which consumes unnecessary resources and, in total, means a rather high amount of unnecessary additional work that we would rather invest in expanding our conservation breeding programmes or other tasks.

All CC animals are the property of the non-profit Citizen Conservation Foundation gGmbH. This also applies to all offspring (see CC guidelines and placement agreement). Owners are therefore not permitted to give away or sell the offspring themselves. Offspring are distributed within the project as long as this makes sense in terms of population management. If offspring cannot or should not be distributed within the project, they may be given away to outside parties after prior consultation with the CC office or may be arranged by the CC office, e.g. to licensed dealers. The proceeds from this go to CC and contribute to the financing of our species conservation programmes. Transfer to the trade therefore also supports CC's species conservation work, not least because it greatly reduces the motivation for potential smuggling from the country of origin.

An essential part of CC is the coordination of our stock, which is why we must always be informed about its development. Twice a year, CC participants are therefore contractually obliged to submit a stock report, currently always on 1 March and 1 September. This inventory report (number of animals, their sex if possible, animals that have died or been bred in the last six months) can be submitted online. The CC office will send you a reminder in good time and will also inform you of the current procedure for submitting the inventory report.

The CC inventory report is a valuable tool for the CC and the breeding programme. It provides us with a clear overview of the current breeding situation and enables us to make informed decisions about the future.

We also welcome any observations and experiences you may have had with keeping and breeding these animals, as one of CC's key objectives is to generate knowledge about ex situ conservation and the biology of the species cared for in our conservation breeding network. This is particularly valuable in the case of a little-known species such as *Ecnomiohyla valancifer*.

We are also always happy to receive photos or videos of animals and their care. We can then use these for publications or social media, for example. Permission to use the images within the framework of the CC programme is deemed to have been granted upon submission, unless expressly objected to; CC always credits the image author in publications, unless expressly objected to.

Please also inform the CC office informally by email at amphibien@citizen-conservation.org about unusual or unexplained deaths between inventory reports so that further steps, such as investigations of other animals, a post-mortem examination or veterinary care, can be discussed if necessary.

When reporting clutches and young tadpoles, only estimates are often possible, but these are still helpful. Please also inform the CC office of any successful breeding, even if not reported in the population reports, so that new keepers for the offspring can be found in good time if necessary. It should also be clarified whether and how many young animals should be reared for population management purposes. If breeding does not seem appropriate at the moment, the spawn can be discarded without any problems.

If owners are no longer able or willing to keep the animals or offspring, the CC office must be informed as early as possible so that we can find new homes for the animals.

Whenever animals are moved within CC, i.e. from one person to another, veterinary tests must be carried out. A skin swab for the chytrid fungus Bd and a faecal sample for parasites must be examined; further tests may be arranged if necessary.

Instructions and the necessary dry swabs and faecal sample tubes can be provided by CC, which will also cover the costs of the tests. A corresponding test request form for a suitable testing laboratory is available from the CC office.

Under no circumstances should the animals be placed together with other conspecifics that are not included in the CC programme. Socialisation with other Ecnomiohyla species should also be avoided due to the risk of hybridisation (apart from the fact that these rather aggressive frogs can hardly be kept together with other tree frogs anyway). In order to establish a long-term conservation breeding programme, it is crucial that the genetic background of the animals can be traced, which is why uncontrolled mixing with animals from outside the programme must be avoided. From a studbook management perspective, it is often desirable to avoid mixing between generations.

Therefore, please do not keep parent and sexually mature offspring together without prior consultation with the CC office! Siblings, on the other hand, can be kept together without hesitation and also bred with each other until the CC studbook records indicate otherwise.

Detailed further explanations on how CC works can be found in our guidelines and on our website citizen-conservation.org in the FAQ section.

Transport of tree frogs: individually packed in small plastic containers and well protected by a polystyrene box
| Timo Deible, Zoo Karlsruhe

4.2 Transport and quarantine

Please note that with CC, the recipient is responsible for the transfer of the animals and must also bear the costs.

Ideally, the frogs should be collected from the previous owner. This is the least stressful option for the animals, and it gives you the opportunity to discuss any questions you may have about keeping them or perhaps take a look at how they have been kept up to now. Alternatively, exchanges, conferences, etc. are also suitable venues for a handover, either in person, or you can ask other hobbyists in the region if they can take the animals with them.

If personal delivery is not feasible, shipping is also possible. The frogs usually survive this without any problems. Please note that vertebrates may only be shipped by licensed companies. Unfortunately, at least at present, no companies offer this service to private individuals. However, the CC office can also arrange shipping for transport to and from private individuals. As this involves some additional work for the CC office, we ask that you thoroughly explore all other options before resorting to this possibility. The CC office will then provide you with an information sheet on shipping.

Within CC, all frogs must be tested for the chytrid fungus Bd and parasites when they are relocated. You can also obtain a CC information sheet on how to do this correctly, and we will send you dry swabs and faecal sample tubes if required. CC will cover the costs of these tests; you only have to pay the postage for sending the samples to the testing laboratory.

During transport and especially during shipping, care must be taken to ensure that the fringed leaf frogs do not overheat. Temperatures above 25 °C should be avoided. It is best to place the animals individually in cricket boxes with some damp moss or damp kitchen paper for transport and secure the boxes with tape to prevent the lid from being pushed open. Then place the boxes in a heat-insulating box, e.g. a polystyrene box. A cooling pack prevents overheating, depending on the outside temperature. In winter, a heat pack may be necessary.

Upon arrival, the frogs are placed in a quarantine terrarium and kept in quarantine for several weeks in accordance with the general rules for terrarium keeping. After that, further care is as described below.

4.3 The Terrarium

- Size

Ecnomiohyla valancifer is a large, robust tree frog that requires spacious terrariums.

The genus is not explicitly listed in the 'General Care Guidelines for Anurans' of the DGHT-AG Anurans, as it was still classified as Hyla when these guidelines were drawn up. Technically, it belongs to group 76, 'Large tree frogs'. For species in this group, the recommended terrarium size for keeping a pair is 10 x 5 times the head-torso length of the animals, multiplied by a factor of 10 for the height. Assuming an adult fringed-leg tree frog is 9 cm long, this results in a terrarium measuring 90 x 45 x 90 cm (length x width x height). However, there is also good experience with slightly smaller or differently proportioned tanks. Karl-Heinz Jungfer successfully uses tanks measuring 60 x 80 x 80 cm for keeping and breeding, while Philipp Ginal uses tanks measuring 50–80 x 40–50 x 50–70 cm. At Allwetterzoo Münster, a pair is kept in a 75 x 65 x 140 cm terrarium. Philipp Ginal successfully keeps the animals in a group of six in a 45 x 45 x 60 cm terrarium; breeding is regularly successful in this tank.

Citizen Conservation recommends terrariums measuring at least approx. 80 x 60 x 80 cm (length x width x height) as the minimum size for keeping a pair.

Terrarium for *Ecnomiohyla valancifer* | Philipp Ginal

Artificial tree hollow in Karl-Heinz Jungfer's terrarium | Karl-Heinz Jungfer

Artificial tree hollow at Münster All-Weather Zoo, viewed from the side | Christian Langner

Artificial tree hollow in Philipp Ginal's terrarium | Philipp Ginal

Since the Lichenose Fringe-limbed Treefrog breeds in tree hollows filled with water, the animals must be provided with artificial tree hollows as a water feature in the terrarium. Karl-Heinz Jungfer uses small, glued glass aquariums measuring 22 x 15 x 18 cm for this purpose, which are lined with baking cork panels on three sides. The rear cork panel is approx. 30 cm high and thus protrudes far beyond the aquarium – this imitates the character of a tree hollow and is particularly important for breeding (see below). The cork absorbs water from below and therefore provides a moisture gradient running from bottom to top, allowing the female to choose the most suitable place to lay her eggs.

Philipp Ginal offers a water section measuring 25 x 25 x 10 cm as a tree hollow substitute; in his case, the bottom of the terrarium is completely flooded. However, half of the bottom is covered with aquarium filter mats as a land section, while the rest forms the water section measuring 25 x 25 x 10 cm. Several pieces of cork are arranged above this as a roof. These are kept moist by misting several times a day.

At Münster All-Weather Zoo, an artificial pot with a tree trunk look, approx. 12 cm high and with a diameter of 15 cm, is used as a storage container or tree hollow substitute. The water level is kept approx. 3–4 cm below the maximum possible fill level, and there are a few alder cones and beech leaves in the water. The cavity substitute has been very well received. Both the fertilised eggs and the later nutrient eggs were laid at the edge, above the waterline.

- Socialisation

The Lichenose Fringe-limbed Treefrog is large, powerful and very defensive. Co-habitation with other species in 'normal terrariums' is therefore considered problematic. Citizen Conservation therefore does not recommend co-habitation with other species; if this is planned with CC animals, the project must be clarified with the CC office in advance.

Keeping adult animals in pairs is usually unproblematic and is the primary recommendation of Citizen Conservation. Keeping several animals in groups is possible in principle, and Philipp Ginal and Wuppertal Zoo have had positive experiences with this. However, such socialisation can also lead to problems, as males in particular can become very aggressive when defending their breeding burrows. Fights between breeding or brooding males can lead to serious injuries, such as damage to the eyes or eardrums, and even death. Even without such direct fights, subordinate males may suffer from stress, which can manifest itself in injuries to the snout sustained when trying to escape from the reach of their superior conspecifics in the terrarium. Or they may develop poorly because they are less likely to venture out of their hiding places to eat. Therefore, socialisation in groups with several males is risky.

Tadpoles and juveniles before reaching sexual maturity, on the other hand, are compatible with each other and, interestingly, are also left alone by adult animals. This acceptance of juveniles of their own species is unusual in tree frogs; normally, smaller conspecifics are eaten. Nevertheless, we advise against raising the young in their parents' terrarium, as we cannot rule out the possibility that the young animals will be eaten or hurt after all.

- Terrarium equipment

The most important part of the setup is the water section mentioned above, which serves as an artificial tree hollow. Otherwise, the terrarium should be equipped with sturdy climbing branches appropriate for the size of the frogs, which should be arranged horizontally, diagonally and vertically to offer the frogs a variety of climbing options. The walls can be decorated with cork panels or various artificial backdrops, depending on your taste. These also serve to provide the animals with additional space to move around, although the frogs can also simply walk along the glass and sit on vertical glass surfaces. It is important to provide them with sufficient hiding places, such as various caves or niches, which can be created with cork, artificial caves, clay bowls, stones or by designing the terrarium walls accordingly.

The terrarium should be densely planted with robust plants. Suitable plants include bromeliads, tillandsias, monsteras, ivy and numerous other large-leaved plants.

For hygienic reasons, substrate is not necessary in tree frog terrariums. Alternatively, aquarium filter mats can be used, which are easy to remove and clean. In addition to being more hygienic than traditional substrate, they have the advantage that no soil or gravel from the land can be carried into the water section.

However, it is also possible to use natural substrates such as soil as substrate; in this case, particular attention must be paid to regular cleaning, and the tank should preferably be somewhat larger.

Pieces of cork bark are well suited as structural elements and resting places. | Philipp Ginal

The terrarium should be furnished with robust plants. | Philipp Ginal

- Terrarium climate and technical equipment

According to current knowledge, nocturnal frogs do not have any special lighting requirements. It should simply ensure a day-night rhythm and plant growth. Fluorescent lamps or LED bars are well suited for this purpose. In principle, it cannot be ruled out that the tree-dwelling frogs also sunbathe or sleep in sunlight in their habitat. In appropriately large terrariums, heating, if desired at all, can therefore be provided by a metal vapour mixed light lamp with UV component, which can be used to create a sunbathing spot for the animals. The use of UV-emitting fluorescent lamps for basic lighting can also be useful; at Münster Allwetterzoo, Arcadia tubes were installed above the gauze in the lid for this purpose. Ultimately, the influence of UV light on these frogs is not yet sufficiently known, but it is known from other species that it has a fundamentally positive effect, even if it is not absolutely necessary. We therefore recommend providing a UV component in the lighting.

It is very important not to keep the frogs in a classic warm tropical terrarium! *Ecnomiohyla valancifer* originates from mid-altitude cloud forest areas, where temperatures are significantly lower than in lowland rainforests. During the summer months, daytime temperatures should be between 20–24 °C and drop significantly at night to 16–20 °C; even lows below 10 °C are not a problem. During the winter months, it can be a few degrees cooler both during the day and at night. The frogs are still active at temperatures of 13 °C, albeit somewhat sluggish.

In Philipp Ginal's terrarium, temperatures range from 19–24 °C during the summer months and drop to 15–20 °C in winter.

During the mating season, high humidity in the terrarium is essential for successful breeding. | Philipp Ginal

The terrarium climate must be very humid at times, as the frogs are cloud forest dwellers. When misting, the terrarium climate reaches air supersaturation (over 100% relative humidity). The tree hollow water section and the plants already provide basic humidity, but the terrarium must also be sprayed or misted regularly. The installation of a sprinkler and/or misting system is strongly recommended. However, adult frogs are quite tolerant and can withstand drier periods as long as they have at least one source of water available.

Depending on the location, a terrarium heater (e.g. heat panels) may be necessary to achieve the desired daytime temperatures. However, the greater challenge with an indoor terrarium is usually the relatively low temperatures required. Basements, conservatories, greenhouses or garden sheds may be suitable locations for terrariums.

We do not yet have any experience with open-air terrariums, i.e. terrariums set up outdoors and consisting mainly of gauze, for keeping Ecnomiohyla valancifer. However, when keeping other frogs from cloud forest regions with comparable temperature requirements, temporary keeping in such outdoor terrariums has proven very successful and would certainly also be practicable for keeping the Lichenose Fringe-limbed Treefrog. It is important to ensure that the animals cannot overheat (under no circumstances should you choose fully glass or predominantly glass terrariums; shade must always be available) and that high humidity is still guaranteed.

Nozzles of an irrigation system | Heiko Werning

4.4 Care

- Regular maintenance work

Trees-dwelling frogs are often more susceptible to parasites and other pathogens than ground-dwelling species. Hygiene in the terrarium is therefore particularly important. For this reason, some tree frog owners do not use substrate or choose materials that are easy to clean, such as filter mats.

However, *Ecnomiohyla valancifer* appears to be quite robust and not particularly sensitive when it comes to hygiene. This could be because the animals probably spend most of their lives in tree hollows filled with water in the wild. Such small bodies of water usually contain a large amount of decomposing organic material and low oxygen content.

In any case, it is advisable to remove coarse contaminants such as faeces or dead food animals from the terrarium as quickly as possible. In practice, long tweezers, a spoon or similar tools are helpful for this, unless you simply pick up the contaminants with your fingers.

The water in the artificial tree hollow does not need to be changed regularly, but only when necessary in the event of heavy soiling.

As cloud forest dwellers, frogs need high humidity and regular sprinkling or misting, at least during the mating season. The terrarium should be allowed to dry out during the day and sprayed in the evening so that it is wet in the tank at night. While very humid conditions are required during the mating season, daily or several times weekly sprinkling or spraying is sufficient at other times.

- Handling

Be careful when handling Lichenose Fringe-limbed Treefrogs: they are defensive and can react aggressively when disturbed by biting or clinging to their opponent, which can be surprisingly painful given their prepollex. If the frogs need to be moved, it is best to place them in small plastic containers ('cricket boxes').

Most individuals can still be picked up easily with bare hands and do not show any aggression. However, it is advisable not to offer the animals a single finger as a target, as they are very eager to eat and will snap at any potential prey. When handled with bare hands, the frogs tend to be calm. Even in the terrarium, this species shows no shyness and will sometimes come towards you when you open the lid.

Normally, frogs are calm to handle, but caution is still advised with these voracious eaters with their sharp prepollex.
| Philipp Ginal

- Nutrition

Lichenose Fringe-limbed Treefrog seems to feed on live animals. It is fed with standard terrarium feed animals such as crickets, grasshoppers, woodlice, cockroaches, *Zophobas*, etc. These should themselves have been fed a high-quality diet (feed pellets, fresh vegetables, fruit, flake feed, etc.). Before feeding, the feed animals are dusted with vitamin and mineral powders commonly used in terrariums. Philipp Ginal has found that feeding once a week and dusting the feed animals with 'Herpetal Amphib' works well.

Adult frogs are fed once or twice a week. As a rule of thumb, feed each frog approximately five medium-sized to large crickets or grasshoppers per week. In any case, only offer as many feed animals as can be eaten in a short period of time.

This species is very greedy and therefore quickly becomes overweight. It is advisable to always place a jar of Drosophila in the tank for young animals and to feed the frogs one to two times a week with more nutritious food such as crickets.

Crickets are often eaten. | Heiko Werning

5. Offspring

Nothing is known about the reproduction of *Ecnomiohyla valancifer* in the wild; spawning sites in its habitat have not yet been found. The frogs probably choose water-filled tree hollows, or perhaps large bromeliads, to lay their eggs. Our knowledge of the reproductive biology of this species comes exclusively from observations in terrariums.

The mating trigger is apparently the seasonal fluctuation in temperature, so keeping them in a cooler environment in winter is essential. Additional sprinkling or misting from spring onwards also contributes to reproductive success. Under terrarium conditions, reproduction takes place at the beginning of spring when temperatures rise again, usually in conjunction with strong spring storms outside, which the frogs perceive due to the falling air pressure. The readiness to reproduce is recognisable by an increased call readiness.

The calling behaviour of this species is rather weak for tree frogs, and the call is rather quiet compared to similarly sized species such as some Litoria or Trachycephalus. It is reminiscent of a squeaky garden gate. They call mainly during the mating season and occasionally in between. The species can therefore be kept in residential areas.

The frogs enter amplexus in the artificial tree hollow. | Christian Langner

Amplexus can last several days. | Peter Janzen

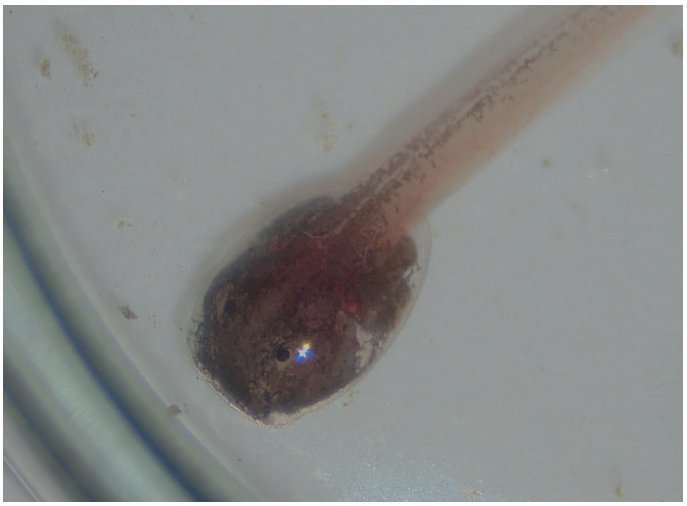
Pair in amplexus with clutch | Manuela Hofmann

The eggs are thrown onto the wall above the water level. | Peter Janzen

The key to successful breeding is the artificial tree hollow (see above). The pair of frogs retreats into the water to reproduce and enters amplexus. The female then uses her hind foot to throw the eggs onto the damp wall of the tree hollow, up to 15–20 cm above the water level. In the case of the 'tree hollow aquarium' described above, the cork back wall protruding above the water section or the pieces of cork attached above the water serve this purpose.

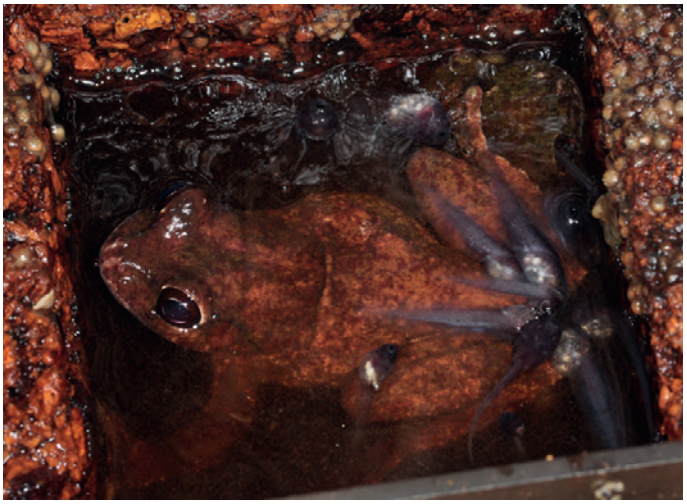
The female waters the eggs regularly. After hatching, the tadpoles fall or jump into the water. There, they are regularly fed nutrient eggs by the female. The male guards the tree hollow throughout the entire development period, protecting both the spawn and the tadpoles. Potential intruders are attacked and driven away by bites or clinging. The latter can be surprisingly painful for humans due to the pointed prepollex. Other frogs can be killed by this. The mother identifies herself to the male with a special call as soon as she approaches the eggs and tadpoles to feed them.

The tadpoles should normally be raised entirely in the artificial tree hollow in the parents' terrarium. The tadpoles are very robust in terms of poor water quality, but also complete water changes, and there are hardly any losses. Additional feeding is not necessary.

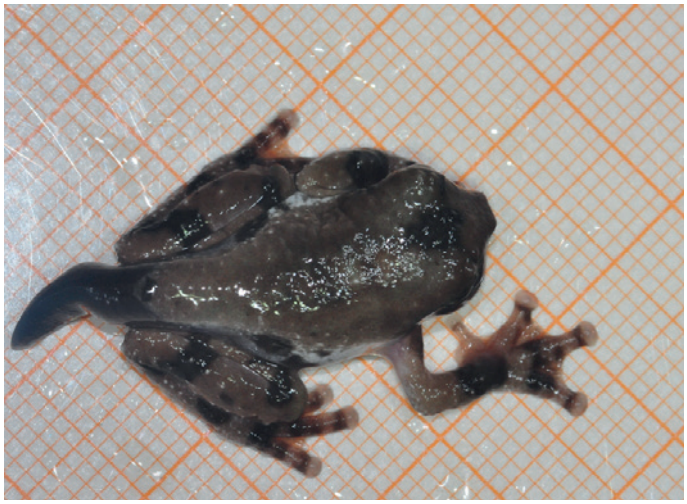


Young tadpole of *Ecnomiohyla valancifer* | Peter Janzen

The nutrient eggs eaten by the tadpoles can be seen shimmering through the abdominal skin. | Kristina Theobald



The female feeds the tadpoles with nutrient eggs. | Peter Janzen



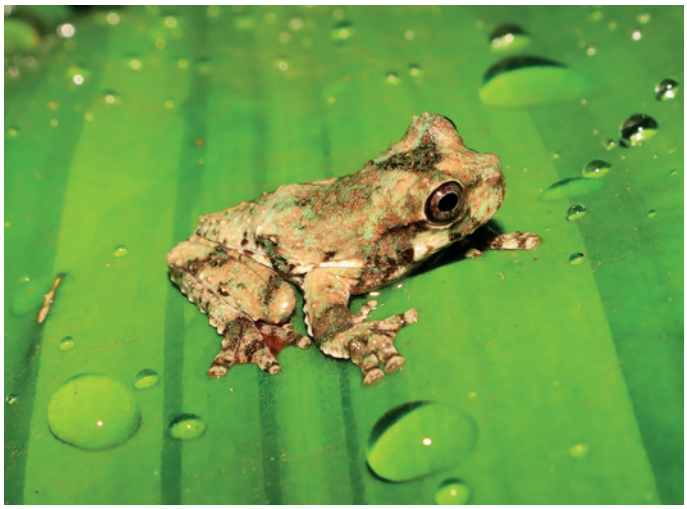
Young frog in metamorphosis | Peter Janzen

The development time of the tadpoles can range from about six weeks to over six months, depending heavily on external conditions such as temperature and feeding.

The metamorphosing young animals have no problem reaching land on their own. They are then about 2–3 cm in size and only need to be collected and transferred to breeding terrariums. The fully developed young frogs after metamorphosis are not attacked by their parents. But even though the adult frogs are not aggressive towards the young animals, they are quite rough when feeding and do not pay attention to where they land when jumping. Therefore, it is safer to rear the young frogs separately.

Tadpoles can also be raised outside in a separate aquarium. They are then fed once a day with standard fish flake food. However, we recommend leaving the rearing to the brood-caring female in the terrarium.

Breeding terrarium | Philipp Ginal



Young frog, a few days old | Christian Langner

- Rearing of young frogs

The young frogs can be reared in appropriately smaller terrariums under the same conditions as the adult animals. The young animals are not aggressive towards each other and can be raised together. They are fed several times a week. It is particularly important to ensure high humidity for the young animals. For reasons that are not yet known, rearing the young animals can be very difficult, and there are sometimes high losses in the first six months.

6. Problems

As inhabitants of cloud forests, these frogs cannot tolerate the conditions of a warm rainforest terrarium! It is essential to observe the specifications for the terrarium climate!

The aggressiveness of the frogs makes socialisation problematic; even other frogs of the same size can be killed.

The mortality rate of young animals can be very high for reasons that are still unknown. Bacterial infections may be the cause, so maximum hygiene should be observed, especially during rearing, even if the adult animals are not susceptible.

The frogs also move around easily on the glass. | Sandra Honigs

7. Further Reading

Duellman, W.E. (2001): The Hylid Frogs of Middle America. – Society for the Study of Amphibians and Reptiles, Ithaca, New York, USA.

Faivovich, J., C.F.B. Haddad, P.C.O. Garcia, D.R. Frost, J.A. Campbell & W.C. Wheeler (2005): Systematic review of the frog family Hylidae, with special reference to Hylinae: Phylogenetic analysis and taxonomic revision. – Bulletin of the American Museum of Natural History 294: 1–240.

Pineda, E. J. Aguilar-López, J. Lee, L. Canseco-Mssarquez & O. Flores-Villela (2020): *Ecnomiohyla valancifer*. – The IUCN Red List of Threatened Species 2020: e.T55685A53958972. https://dx.doi.org/10.2305/IUCN.UK.2020-2.RLTS.T55685A53958972.en. Accessed on 14 October 2025.

Köhler, G. (2011): Amphibians of Central America. – Herpeton-Verlag, Offenbach

Lee, J.C. (2000): A Field Guide to the Amphibians and Reptiles of the Maya World. – Cornell University Press, Ithaca, New York, USA.

Mendelson III, J.R., A. Eichenbaum & J.A. Campbell (2015): Taxonomic Review of the Populations of the Fringe-Limbed Treefrogs (*Hylidae: Ecnomiohyla*) in Mexico and Nuclear Central America. – South American Journal of Herpetology 10(3): 187–194.

Mendoza, E., J. Fay & R. Dirzo (2005): A quantitative analysis of forest fragmentation in Los Tuxtlas, southeast Mexico: patterns and implications for conservation. – Revista Chilena de Historia Natural 78: 451–467.

Solórzano García, B., E.A. Ellis & E. Rodríguez-Luna (2012): Deforestation and Primate Habitat Availability in Los Tuxtlas Biosphere Reserve, Mexico. – International Journal of Ecosystems 2(4): 61–66. DOI: 10.5923/j.ije.20120204.03