

TAXON MANAGEMENT GROUP (TMG) PROPOSAL

Species:

Ranitomeya (Dendrobates) *imitator* (Schulte, 1986)

English Names

Mimic Poison Dart Frog

Imitating Poison Frog

Distribution:

Eastern foothills of the Andes in the Lower Amazonian, north central eastern Perú.

Habitat:

Primary lowland tropical moist forest; 250-1000m above sea level. Usually closely associated with certain secondary forest plant speciesⁱ; phytotelm breederⁱⁱ.



(Nominal; photo courtesy J.P. Lawrence)

Personal observations of habitat (Chuck Nishihira):

“In 1988/89 I was fortunate enough to visit a few different Ranitomeya imitator sites. They occurred at various spots along the road between Tarapoto and Yurimaguas. Their distribution along the road seemed spotty. In some areas they were abundant, while in other very similar locations none could be located. Beginning at roughly 12 km outside of Tarapoto was an orange/yellow form that was most abundant in the large Xanthosomas that grew along the roadside as well as slightly into the forest. Calling was easily heard and density seemed to be quite high. Going further along this road at roughly kilometer 20 was another pocket of imitators that lived alongside R. variabilis. Here the numbers of imitators were not as high and locating animals not as easy. The imitator seen here were a yellow form. Eggs of both imitator and variabilis were discovered in small bromeliads. The lighter colored imitator eggs were always on the backside of the bromeliad leaf right over the water collected by the lower leaf. R. variabilis in comparison placed their clutches on the top surface of the leaf. R. fantastica was sympatric in this area as well. At kilometer 33 a green/yellow form of imitator was observed. These were located far from the road in an area where three rivers (clear water, black water, and white water) were running next to each other. Between these rivers were stands of large Heliconias. The frogs lived within the tight spaces of the plants. It's pretty amazing that they get in there at all, but from between the bracts you could hear the males calling. Within these tight spaces and small amounts of water you can find eggs as well as tadpoles. Maybe 10 km before Yurimaguas we found a striped imitator for the first time that Schulte eventually named Dendrobates yurimaguensis (I believe at present this is just considered a form of R. imitator). They were found in lowland forest in low densities. They seemed to be found a few meters off the ground, even on vines. No tadpoles or eggs were found at the time, so I am unsure as to where they were breeding. R. imitator were also observed on the road to Chazuta. In the area near Chumilla larger brighter orange imitators were observed. These also had lighter and brighter blue legs. Other areas where R. imitator were seen in 88/89 were near the Rio Cainarachi and Boca Toma in Tarapoto.”

Protected Status:

- CITES, Appendix II

Conservation Statusⁱⁱ:

- IUCN Red List – *Least Concern* (as of 2004)
- Listed as Least Concern in view of its wide distribution, presumed large population, and because it is unlikely to be declining fast enough to qualify for listing in a more threatened category.
- No major threats, a widespread species with large areas of suitable habitat remaining. There is some localized habitat loss to different human activities such as agriculture. Small-scale illegal trade in this species has been observed.

Status in Captivity:

<u>Population Name</u>	<u>Origin (Location, Year)</u>	<u>Notes</u>	<u>Management</u>
Nominal	Europe, 1997-	Represented by multiple lineages	Track
Cainarachi Valley	Peru, 2006-07	INIBICO imports; Locale data	Manage
Intermedius	Europe	Represented by multiple lineages	Track
Chazuta	Peru, 2007-	Understory Enterprises	Manage
Banded Intermedius	Germany	Multiple lines	Manage
“Tarapoto”	Peru (?), ca. 1996	Tor Linbo lineage	Track
Tarapoto [Understory/INIBICO]	Peru, 2006-	Understory Enterprises and Sean Stewart imports; Locale data	Manage
Yurimaguensis	Germany 2005–06	Represented by multiple lineages	Track
Veradero	Peru, 2006 -	Understory Enterprises; Locale data	Manage
Bajo Huallaga	Peru, 2008-	Understory Enterprises; Locale data	Manage

Note: Population names denoted by quotation marks are named for their resemblance to frogs from a specific locality; however, there is not enough locality data available to confirm the origin of the captive population. Frogs from quoted populations should not be mixed with frogs from confirmed (unquoted) populations.



(Nominal; photo courtesy of Stacey and Tony Cotterman)



(Cainarachi Valley; photos courtesy of Rob “Oz” Ossiboff)





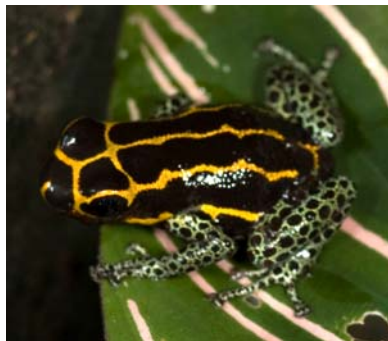
(Intermedius; photos courtesy Shawn Harrington)



(Banded Intermedius; photo courtesy Rob "Oz" Ossiboff)



("Tarapoto"; photos courtesy Michael Khadavi [left] and Gary McCarthy [right]) (Tarapoto; Understory [left] and INIBICO [right]; photos courtesy Rob "Oz" Ossiboff)



(Yurimaguensis; photos courtesy Rob "Oz" Ossiboff)



(Bajo Huallaga; photo courtesy Jason Alkirwi)



(Veradero; photos courtesy Julio Rodriguez [left] and Jason Alkirwi [right])



(Nominal; photo courtesy J.P. Lawrence)

- Population Notes:
 - The **Nominal** population is composed of several lineages present in captivity. These lineages have been identified through the years according to the individuals who bred or imported the frogs (such as Sens, Nabors, Kelley, Putnam, and Tan). The exact origins of these frogs from the wild are not known, but given the knowledge of the natural populations of *R. imitator* in the wild, it is likely they originate from the Cainarachi Valley.
 - The **Cainarachi Valley** population was imported by the INIBICO project during 2006 and 2007. The earliest imports were divided and sold as “Green” and “Yellow”; these phenotypic variations were determined to come from the same variable contiguous population and should be managed as such.
 - The **Nominal** and **Cainarachi Valley** populations are phenotypically similar. However due to the locality data associated with the Cainarachi Valley population, the two populations should currently not be mixed.
 - The **Intermedius** population is composed of at least three lineages of frogs (Uhern/Kelley/Tarleton, Wolfe/Linbo, Nabors). The exact origins of these frogs from the wild are not known. However, given their similar phenotypes, it is possible they all originate from the same location. Additionally, the knowledge of the natural populations of *R. imitator* in the wild suggests that these frogs all come from a similar region (the area around Chazuta in the Huallaga Valley). Coupling the lack of definitive knowledge regarding the locality of these frogs along with their similar phenotypes to each other and a known population, the different lineages of Intermedius in the hobby should be mixed to maximize the genetic variability in the captive population.
 - The **Banded Intermedius** population in the hobby likely represents individuals from a distinct geographic location (south bank of the Huallaga Canyon); this population is sympatric with *R. summersi*. Although the exact origin of captive specimens is unknown, reports from individuals familiar with wild *R. imitator* population distributions support management of this form as a geographically distinct population (separate from other Intermedius) and as the only known captive representatives of this wild form.
 - Frogs from the **Chazuta** population are currently being bred by the Understory Enterprise program, but have not yet been made available to the private hobby. A small number of these frogs imported independently of the Understory project are currently being bred in North America. The Chazuta population is phenotypically similar to the hobby Intermedius, but since it has locality data associated with it and the Intermedius population does not, the two populations should not be mixed.
 - There are two Tarapoto populations currently represented in captivity. One population (“**Tarapoto**”) is represented by offspring from a small founder population of frogs that were believed to have been collected in the Tarapoto region of Peru in the mid-90’s. The other population (**Tarapoto [Understory/INIBICO]**) is composed of frogs made available through the Understory Enterprises project (Mark Pepper/Manuel Sanchez; 2007-present) and an import of frogs by Sean Stewart in 2007. This population of frogs is variable with dorsal coloration ranging from gold to orange and leg coloration from green to blue (see Hicks, Tracy. *Tarapoto: Catching frogs in Peru*. Leaf Litter Magazine, TWI. Summer 2008, pgs. 11-14). Because of the known locality of the Tarapoto [Understory/INIBICO] population, it should not be mixed with the “Tarapoto” population.

- The captive population of **Yurimaguensis** is represented by at least two lineages of frogs. One lineage (Werner) originated from captive bred German stock in 2005. Another population (Tan) originated from captive bred Czech Republic stock in 2006. As neither of these lineages can be traced back to an exact location, these lineages should be mixed. Any additional Yurimaguensis lineages lacking locality info should also be mixed with other lineages lacking locality data.
- The **Veradero** population was made available to the North American hobby by Mark Pepper and the Understory program in early spring of 2009. These are the first offspring of locality specific Veradero legally available to private hobbyists. Frogs labeled as “Veradero” have been made available in the European hobby, and may make their way to the North American hobby in the future. However, at the time of publication of this TMP, no lineage or locality info was able to be associated with these frogs. So, at this time, only Veradero originating from Understory Enterprises will be managed as a population. Furthermore, until more information is collected, European origin “Veradero” should not be mixed with those from the Understory program.
- The **Bajo Huallaga** population was made available to the North American hobby by Mark Pepper and the Understory program in early spring of 2009. These frogs are locality specific to the lowlands of NE San Martin and Loreto provinces, and are reputedly the most commonly occurring *R. imitator* phenotype in the wild. Although they may share some phenotypic similarities with Yurimaguensis, they represent a distinct captive population with locality data and should not be mixed.
- All populations of *R. imitator* have successfully reproduced in captivity.

Suitability of Facilities Participating in this TMG:

There will be numerous small widely scattered private facilities participating in this program. As this is a small frog (17 – 22mm)ⁱⁱⁱ, they do not require extraordinarily large or elaborate enclosures. They can be maintained in tanks as small as 10 gal. (38 l), although larger, vertically oriented enclosures are recommended. These frogs require high levels of relative humidity, which is best achieved through enclosure design. Temperature ranges must be maintained year-round between 18.3 – 26.7°C (~65 - 80°F); facilities must be prepared to correct/prevent exposure of the animals to temperature extremes.

Husbandry techniques:

Successful husbandry techniques for *R. imitator* have been determined. They have been maintained in standard aquariums set-up horizontally or vertically, containing substrate (LECA, coco fiber, soil, etc.), leaf litter, and appropriate plants. Bromeliads are used extensively by the frogs for sleeping, egg deposition, tadpole rearing, and hiding. Film canisters, positioned vertically or at an angle and containing a small pool of water in the bottom are used for egg deposition and tadpole rearing. Eggs may even be laid on the glass of the enclosure. *R. imitator* can be maintained on a diet consisting primarily of fruit flies (smaller species, such as *Drosophila melanogaster* are preferable over the larger species, such as *D. hydei*), although supplementation with other feeder insects (springtails, isopods, aphids) is recommended and likely beneficial to their health in captivity.

ASN partners within the TMG:

TMG Point Person: Sarah Smith (imitator "dot" tmg "at" treewalkers "dot" org)

- Rob “Oz” Ossiboff
- Shawn Harrington
- Nate Paull

Ultimate Goal of the Captive Populations:

Maintaining a viable population (combinations of individual pairs and small groups) over time.

The goals are i) to establish a captive assurance colony of the Cainarachi Valley, Tarapoto [Understory/INIBICO], Banded Intermedius, Chazuta, Veradero, and Bajo Huallaga *R. imitator* populations in North America to preserve the possibility of reintroduction should it become necessary, ii) maintain the other *R. imitator* populations in captivity in numbers adequate to prevent losing them in captivity, and iii) to develop successful techniques for husbandry/reproduction of both populations.

Genetic and demographic goals:

The Cainarachi Valley and Tarapoto [Understory/INIBICO] populations will be managed with a large enough base of founder stock to retain diversity (>90%) for over 100 years. The rest of the populations will be maintained to maximize genetic diversity with the given founder population.

Number of founders and potential founders existing and number needed:

- Cainarachi Valley: There are at least 166 potential Cainarachi Valley population founders currently in North America, although not all are in the ownership of ASN partners [personal communication – Sean Stewart]. No additional potential founders for the Cainarachi Valley population are required for importation into North America.
- Tarapoto [Understory/INIBICO]: There are at least 56 potential Tarapoto [Understory/INIBICO] population founders currently in North America, although not all are in the ownership of ASN partners [personal communications – Mark Pepper, Sean Stewart]. No additional potential founders for the Tarapoto [Understory/INIBICO] population are required for importation into North America.
- The exact number of population founders for the remaining populations of *R. imitator* is unknown. Additionally, as many of the imported frogs were CB animals, their relatedness to each other is also unknown.

Origin and location of founders and potential founders:

Specimens from the Cainarachi Valley and Tarapoto [Understory/INIBICO] populations in North America were exported to the US from Peru (Understory Enterprises, Sean Stewart); specimens from the other populations were imported to the US from stock in Germany, the Czech Republic and potentially other European countries.

Target population size:

The total minimum number of specimens required to genetically and demographically manage the Cainarachi Valley and Tarapoto [Understory/INIBICO] populations will be 70; up to 120 individuals would be desirable.

Define length of program:

Long-term program with a 100 year goal.

Identify sources for specimens included in this Management Plan:

Substantial numbers of specimens are in private collections that will hopefully become ASN partners in the future. In order to acquire the numbers of potential founders that is called for

in the management plan, the TMG will have to actively recruit specimens. An effort should be made to acquire additional unrelated specimens via the INIBICO and Understory projects.

TMG plan for managing this species:

R. imitator should be managed as pairs or small breeding groups with each individual identified. The variable nature of the dorsal spotting of the species should allow for easy and rapid identification of specific individuals. Exceeding a target population size of 70-120 specimens and managing surplus specimens will not be an immediate problem. Offspring produced will be placed preferentially with other ASN partners, but surplus offspring will be made available for sale to the general hobby. Field studies to determine the natural history and size of the wild population should be encouraged and supported.

Current Bibliography:

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ⁱⁱ Javier Icochea, Ariadne Angulo, Karl-Heinz Jungfer 2004. *Ranitomeya imitator*. In: IUCN 2008. 2008 IUCN Red List of Threatened Species. <www.iucnredlist.org>. Downloaded on **28 December 2008**.

ⁱⁱⁱ Symula, R., Schulte, R., and Summers, K. (2001). "Molecular phylogenetic evidence for a mimetic radiation in Peruvian poison frogs supports a Mullerian mimicry hypothesis." Proc. R. Soc. London B., 268, 2405-2421.

