



Rediscovery of the Endangered Khasi Hills Rock Toad, *Bufoides meghalayana* in Meghalaya, Northeastern India

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Bufoides meghalayana, the Khasi Hills Rock Toad, is an Endangered species of tropical bufonid (Stuart et al., 2008), restricted to the Mawblang Plateau, ca. 5 km south of Cherrapunjee, East Khasi Hills, Meghalaya State, north-eastern India. Since its discovery by Yazdani and Chanda (1971: as *Ansonia meghalayana*), and reallocation to the monotyp-



Figure 1. Type locality of *Bufoides meghalayana*, showing patches of *Pandanus furcatus* and large sandstone boulders

ic genus *Bufoides* by Pillai and Yazdani (1973), it has been cited only in regional reviews (e.g., Chanda 1994; 2002) and in checklists (Frost 1985; Dutta 1997). Pawar and Bi-

VOL 92 DEC 2009

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rand (2001) reported *Bufoides meghalayana* from two localities in Mizoram State (Ngengpui Wildlife Sanctuary and Dampa Tiger Reserve). An examination of the specimen that forms the basis of that report (uncatalogued specimen in the collection of the Guwahati-based NGO, Aaranyak; SVL 32.9mm) reveals that it is not conspecific with *B. meghalayana*, as is the single specimen taken recently from Tura, in the Garo Hills of western Meghalaya State (field number MFA 10134; SVL 35.9mm). The identity and relations of these and related species are currently under study, and re-

veal unstudied diversification within the lineage endemic to India, and currently considered monotypic.

Compared to other Indian endemic amphibian species, basic data on the natural history of *Bufoides meghalayana*

is available in the published literature, thanks largely to the two early papers (Yazdani and Chanda, 1971; Pillai and Yazdani, 1973; Chanda, 2002). The species breeds in rock pools and within leaves of *Pandanus furcatus*, during premonsoonal showers (end March to May).

We conducted field work in the forests behind the village of Mawblang (25°15'N, 91°44'E; altitude ca. 1,112m asl; Fig. 1) on 11 March 2009 and observed four adults of *B. meghalayana* in a deep horizontal cleft of a sandstone boulder along a dry rocky stream (Fig. 2), < 0.1



Figure 2. Narrow horizontal cleft in sandstone boulder – micro-habitat of *Bufoides meghalayana*



Figure 3. Adult female *Bufoides meghalayana*

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km from the village of Mawblang. A pair of ranid frogs, *Amolops* sp. were also observed in the same microhabitat at the time. Air temperature inside the rock crevice at 1630 h was 26°C. Two toads (ID 9346-47) could be extracted, representing an adult male (with enlarged testes) and an adult female (with pigmented eggs of diameter 2.5-2.8mm), measuring 39.0 and 39.1mm, respectively, in snout-vent length. The single male observed had bright yellow marbling on lower flanks and inguinal region, that is absent in the female. Fig. 3 shows one of the animals in dorsolateral view, Fig. 4 is the ventral surface of the animal in “unken” reflex, a response widespread in anuran amphibians with noxious dermal secretions (and similar to the image of the venter of the holotype in the original description). The sample (as well as the type series currently in the collection of the ZSI) differs from the descrip-

tion in the literature in showing well-developed parotoid glands. We consequently announce the rediscovery of *Bufoides meghalayana*, over 30 years after the last report of the species.

The extensive deforestation and quarrying activities now taking place in the Cherapunjee region, besides its small known range and specialized saxicolous (including a depressed habitus, presumably to squeeze into narrow rock cracks), and reportedly also, arboreal habits, are presumably factors that threaten the species, which is listed as Endangered (Stuart et al.,



Figure 4. Ventral surface of adult female *Bufoides meghalayana* in “unken” reflex

2008) as a result of “clear-cutting of the species’ forest habitat”. In addition, the locality of observation was close to the garbage disposal site of the village of Mawblang. An earlier assessment during the Conservation Assessment and Management Plan (CAMP) Workshop in 1997 listed the species as Critically Endangered (Molur and Walker, 1998), although it is

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not included in national legislation, such as the Indian Wildlife (Protection) Act of 1972.

Acknowledgements

We thank our respective institutions, the Institute of Biodiversity and Environmental Conservation, Universiti Malaysia Sarawak, North-eastern Hill University, and Zoological Survey of India, for supporting our researches. Our colleague, Mohammed Firoz Ahmed, Aaranyak, allowed us access to material reported as *Bufoides meghalayana*. Saibal Sengupta, Arya Vidyapeeth College, provided logistic support and supplies. Finally, we thank Genevieve V. A. Gee for commenting on the manuscript.

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New findings of harlequin mantella improve the conservation status of Madagascar's most threatened frog

N. Rabibisoa, H. Randrianasolo, M. Anjeriniaina, J. MacKinnon, A. Andriamamonjisoa, Ramandimbison, C. Randrianantoandro and F. Andreone

Madagascar is well known for its diversity of amphibians. Almost 100% of the 244 currently described species are found nowhere else and many others still wait to be described (Vieites et al., 2009). However, due to the loss of habitat, climate change, and over-harvesting in nature, these amphibians are threatened with extinction in the wild if no concrete actions are implemented. In November 2008, during the celebration of the year of Amphibians for Madagascar (YOF), the conservation program for the amphibians of Madagascar - the Sahonagasy Action Plan (SAP) and the Action Plan for the harlequin mantella *Man-*



Fig 1. T-shirts used as tools for local community interviews © Harrison. Randrianasolo

tella cowani - were officially endangered Malagasy frogs. Since 2008 our effort has focuses primarily on *M. cowani*, many stakeholders under the aegis of the Ministry of Environment and Forests. Among other things, these plans recommend different actions to eliminate or achieving both of the following objectives: "Assessment of threats to critically potential site of *M. cowani* in

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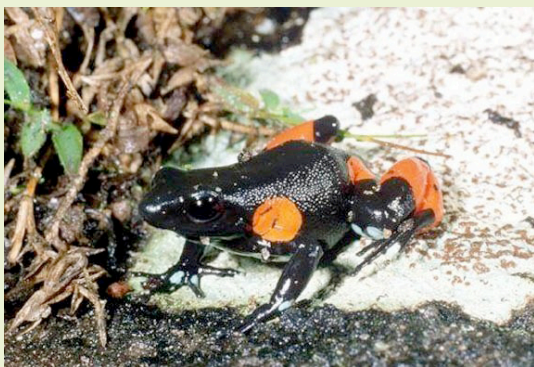


Fig 2. *Mantella cowani* © Franco Andreone

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the highlands of Madagascar” and “Securing the site around Antoetra” (locally known as Fohisokina or Vohisokina). For 2009, regarding the evaluation of various sites in the highlands, two potential administrative regions, Vakinankaratra and Amoron'i Mania, were visited on 4-12 March and 21-22 April. The study methodology consisted mainly of interviewing villagers, and other regional stakeholders regarding the presence of species. Brochures and t-shirts (Fig. 1) illustrating a few critically endangered and emblematic amphibians were used as identification tools during the interviews. We checked all suitable specific habitats (e.g., Rabibisoa,



Fig 3. Habitat of *Mantella cowani* at Antsirakambiaty Itremo © Franco Andreone

2008) likely to contain *M. cowani*, such as interstices of rocks, soil, moss, caves etc. We also employed a standard monitoring technique called Participatory Ecological Monitoring (PEM) with the local guide. According to the GAA workshop of 2003, *M. cowani* is seriously threatened, categorized as Critically Endangered, based on an area of occupancy (AOO) < 10 km², highly fragmented habitat, and overharvesting through international trade (Andreone et al. 2005).

As a result of a combi-

nation of threats including habitat alteration and collection for the pet-trade, *M. cowani* remained Critically Endangered following the recent GAA update (Andreone et al., 2008). Given this alarming situation, considerable research has focused on the species since 2008. These activities are proceeding well with the collaboration of all stakeholders and ASG Madagascar. Prior to 2009, *M. cowani* was confirmed from two regions; the Rural Municipality of Antoetra (Andreone et al. 2005) and the Rural Municipality of Itremo (Fig. 2, 3) (Andreone et al. 2008). In



Fig 4. *Mantella cowani* from Ambatofotsy Betafo © Alain Andriamamonjisoa

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Fig 5. Habitat of *Mantella cowani* at Ambatofotsy Betafo © Nirhy Rabibisoa

addition, it is also identified at Antakasi-
na, near Ambatolampy (Andreone et al.
2007). Two field surveys conducted in
2009 at Betafo additionally confirmed
the presence of the species at this site.
In addition, we found two *M. cowani* -
one juvenile on 16 April and one female
on 20 April (Fig. 4) - at Ambatofotsy
(19°42'16.6" S / 46° 54'44.2" E). In-
terviews with villagers indicated that an
important population of the species oc-
curs at this site; however, to verify this,
research should coincide with the peri-
od of rainy and hot season (Raxworthy
& Nussbaum, 1994), between Novem-
ber and February. This extraordinary
discovery of *M. cowani* in Betafo is of
particular importance with regard to its
status and future conservation efforts.
At Ambatofotsy, the habitat consists of
a savannah rocky mass from which the
rivers and lakes in the surrounding area

receive their water (Fig. 5). Fig. 6 shows the cur-
rent distribution and a potential site for the
presence of *M. cowani* in the highlands. The
extent of occurrence (EOO) is currently in-
creased to 155 km² (in the red line), with the
new area of occupancy detected (AOO, purple

on map), incorporating the addition of Betafo to
the updated GAA (Andreone et al., 2008)
that includes Antoetra, Anta-
kasina and Itremo. The effective protection of *M.*
cowani and its habitat can be achieved through col-
laboration among institu-
tions, organizations, and local communities. Dur-

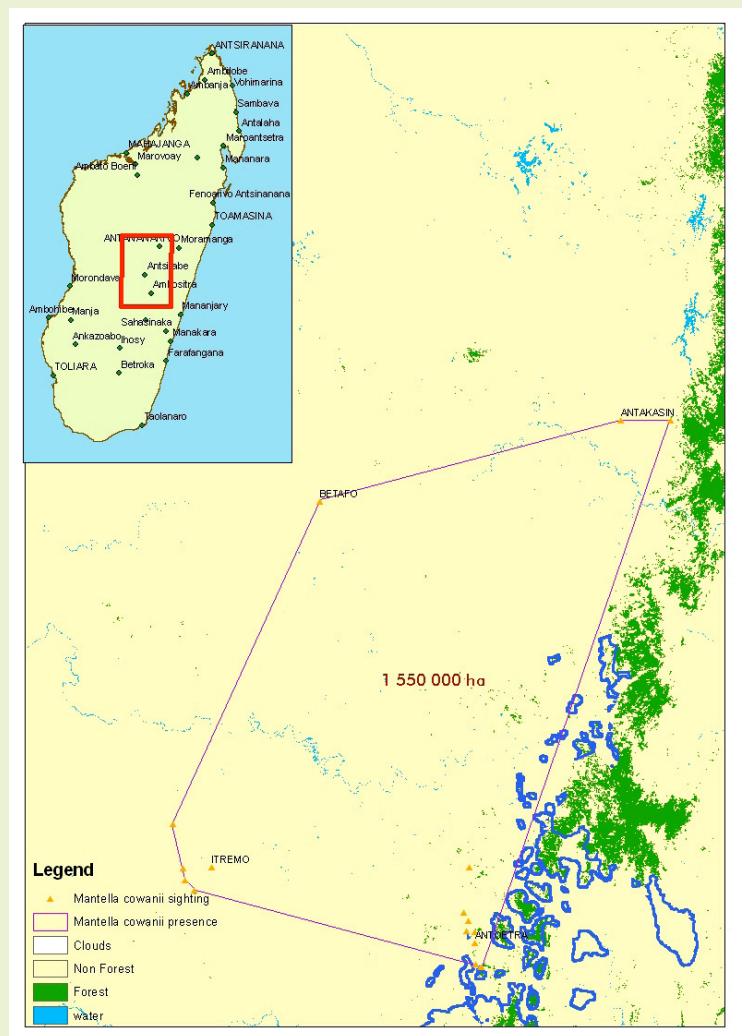


Fig 5. Map showing the new extension of the distribution of *Mantella cowani* in highland of Madagascar. Map by Andriambolantsoa Rasolohery.

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ing the process of implementation of a protected area for *M. cowani* at Fohisokina, the local population from Antoetra and Ivato participated actively in collaboration with the NGO Man and Environment (MATE). It is important to continue research and exploration of other potential sites in the highlands, and to implement the program outlined in the *Mantella cowani* Action Plan.

Acknowledgements:

Thanks to Van Thienhoven Foundation, Moore foundation and Conservation International for having supported this study. Razafindrabe T. helped for the field study at Antoetra. Rasolohery A. helped with the Map.

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A note on the common name of *Polypedates eques* (Rhacophoridae) in Sri Lanka

D. M. N. P. K. Dawundasekara, Rajika Gamage and Anslem de Silva

Most anurans are highly polymorphic in their color pattern and some species exhibit quite distinct colour patterns. Thus, the scientific and common names of some amphibian species have been coined according to their characteristic colour patterns. One such common name is 'hourglass' tree-frog, the common name given to two *Polypedates* species as there is a characteristic mark which resembles an hourglass in *Polypedates eques* and *P.*

cruciger. This common name, 'hourglass' has been recorded for nearly 150 years (Ferguson 1877). Here we wish to show that the use of this common name is not statistically significant.

Materials and methods

Approximately 1000 amphibians belonging to about 50 species of anurans were investigated during the ongoing island-wide survey by the third author to 'Investigate the incidence and geo-

graphical pattern of Malformations, Abnormalities, Injuries and Parasitic infection of Frogs, Toads and Caecilians of Sri Lanka'. During this survey 180 *Polypedates eques* Günther, 1858 (Montane hourglass tree frog = English; Kandukara pahimbu gas



Fig 1. *P. eques* with distinct hourglass pattern © D. M. N. P. K. Dawundasekara



Fig 2. *P. eques* without hourglass pattern © D. M. N. P. K. Dawundasekara

mädiya = Sinhala) were investigated from four montane localities: Ambewela (1600 m), Black Pool (1700 m), around Hakgala (1500 m) and around Horton Plains National Park (2000 m) for the presence of a parasitic infection (a detailed report of the parasitic infection will be published elsewhere).

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The specimens were photographed and released at the original location. The present communication is based on 79 *P. eques* investigated in this survey for the presence / absences of the 'Hourglass', and these 79 frogs could be categorized under two groups:

Group A – those with distinct hourglass pattern on the dorsal side of the body (Fig1).

Group B – specimens without any trace of the hourglass pattern on the dorsal side of the body (Fig 2).

cance of the hourglass pattern.

Results

In the series of 79 frogs, the hourglass mark was present in 64 (81%) and absent in 15 (19 %). The Paired T-Test of presence of hourglass and no hourglass are not significantly different at 99% Confidence Interval. Thus, the age-old common name has not been aptly coined for *Polypedates eques* and is questionable. The distribution of the hourglass mark



Fig 2. *P. eques* aberrant hourglass pattern © D. M. N. P. K. Dawundasekara

mission granted to Anslem de Silva, and to the Amphibian Specialist Group for a Seed Grant to AdS. We thank K. G. Roshan S. Nandana for assistance in the field.

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	Distinct hourglass	No hourglass
Ambewela (1600m)	23	4
Hakgala (1500m)	8	7
Horton Plains (2000m)	15	Nil
Black Pool (1700m)	23	4
Total	64	15

Table 1. Distribution of the Hourglass pattern

However, in 16 (20%) specimens the hourglass mark was aberrant (Fig 3). Nevertheless, these were grouped under category A. A Paired T-Test (99% CI for mean difference) was carried out to test for signifi-

on the dorsal aspect of *P. eques* by the sampled locations are given in table 1.

Acknowledgements

Dept of Wildlife Conservation, Sri Lanka for per-

ASG / PARC Seed Grants: Call for proposals for ARMI Grants

We are pleased to announce, in partnership with Partners in Amphibian and Reptile Conservation (PARC; www.parcplace.org) a new round of ARMI Seed Grants for. These are intended as one-time awards of between \$500 and \$2000 for the support or initiation of research that furthers the ASG's mission to conserve biological diversity by stimulating, developing and executing practical programs to conserve amphibians around the world, in addition to determining the nature, extent and causes of amphibian population declines. There is one category in this round, thanks to generous support from the US Geological Survey's (USGS) Amphibian Research and Monitoring Initiative (ARMI). For more information on ARMI please

visit <http://armi.usgs.gov/>

ARMI AWARDS. The criterion for these awards is that the proposed work should be done on species or issues of concern in the USA. ARMI is particularly interested in funding research on potential stressors of amphibian populations.

Do not hesitate to contact Robin Moore if you need clarification or advice.

Proposals of no more than 4 pages should be addressed to: Robin Moore, Programs Officer, ASG at rdmoore@conservation.org.

Proposals should contain: (1) Name, affiliation and contact information of proposer(s), (2) Project title, (3) Description of the intended work, including

localities and species involved, (4) Start date and schedule of the project, (5) Explanation of how the project will further the ASG's mission, (6) Budget breakdown, including details of additional funding obtained or sought from elsewhere (note that we do not provide funds to support salaries), (7) References, if appropriate, and (8) Any other pertinent information.

All information acquired with the support of the ASG remains the intellectual property of the grant recipient, but must be freely available to the ASG and for the ASG's use in furthering its mission.

The closing date for applications is 1st February, 2010.

Amphibian Survival Alliance to be Formed

On 20-21 August 2009: a group of the world's leading amphibian conservationists and scientists were

convened at the Zoological Society of London by the IUCN Species Survival Commission for the first Amphibian Mini

Summit. The Mini Summit identified two priority initiatives to be implemented through integrated in situ and ex situ conservation actions, and re-

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sulted in agreement to establish the Amphibian Survival Alliance, a coalition of organizations devoted

to amphibian conservation. Please visit www.amphibians.org and click on the relevant links to read the Amphibian Mini Summit Declaration

and Press Release. Here, you may also download presentations made by George Rabb, James Collins, Claude Gascon and Kevin Zippel.

Sabin Award 2009 Recipients Announced

The 2009 Sabin Award for Amphibian Conservation recognized the extraordinary contribution that Franco Andreone and Herilala Randriamahazo have made to the conservation of am-

phibians in Madagascar. Franco and Herilala have worked tirelessly to bridge the gap between science and conservation to increase our knowledge about the status of Malagasy amphibians and ensure their incorporation

into National Conservation initiatives.

Franco and Herilala will be presented with their award by Andy Sabin on January 14 in New York.

Funds for Habitat Protection

The ASG supports organizations working to protect of critical amphibian habitat worldwide. This fund

is specifically for direct conservation action, not research (although some funds can be earmarked for survey work if

this is an integral component of the overall project). Criteria and examples of funded projects can be found at www.amphibians.org.

Instructions to Authors

FROGLOG publishes a range of articles on any research, discoveries or conservation news relating to the amphibian decline phenomenon. We encourage authors describing original research to first make submissions to a refereed journal and then, if appropriate, to publish a synopsis in Froglog. Submissions should be in English, normally no more than 1000

words and follow the style of FROGLOG Vol 91 (as should references). You may also submit images, maps and figures. We encourage the submission of photographs to accompany text. Short news items and press releases are also acceptable. Please submit potential contributions to Robin Moore at the address in the box to the right.

FROGLOG is the bi-monthly newsletter of the Amphibian Specialist Group (ASG). Articles on any subject relevant to the understanding of amphibian conservation, research and / or assessments should be sent to: Robin Moore, Editor, Conservation International, 2011 Crystal Drive, Suite 500, Arlington, VA 22202, USA.

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