

CONSIDERATION OF PROPOSALS FOR AMENDMENT OF APPENDICES I AND II

A. Proposal

To list four species of *Scaphiophryne* spp. (Boulenger 1882) in Appendix II of CITES.

Scaphiophryne gottlebei (Busse & Böhme, 1992)
Scaphiophryne pustulosa (Angel & Guibe, 1945)
Scaphiophryne madagascariensis (Boulenger, 1882)
Scaphiophryne marmorata (Boulenger, 1882)

These species have never been covered by any kind of conservation status. While they may not necessarily be threatened with extinction at the moment, the first two species could become so in terms of Article II, paragraph 2(a), of the Convention, and in line with the criterion for the inclusion of species in Appendix II, as laid down in Resolution Conf. 9.24, Annex 2 a, section B. i)

The two others should be regulated, in order to bring under effective control the trade in specimens of the species above, in accordance with Article II, paragraph 2(b), of the Convention, and in line with the criterion for the inclusion of species in Appendix II, as laid down in Resolution Conf. 9.24, Annex 2 b, section A.

B. Proponent

Madagascar.

C. Supporting statement

The frogs *Scaphiophryne* spp. are endemic to Madagascar. Among the six species belonging to this genus, these four are remarkable and attractive because of their colours (Glaw & Vences, 1994).

The range of *Scaphiophryne gottlebei* is located near to and inside the Isalo National Park (CAMP, 2001) while *S. pustulosa* is found in the massifs of Ankaratra and Itremo and in the Ambohitombo forest [Vences *et al.*, in press].

The areas of distribution of *S. madagascariensis* and *S. marmorata* are not restricted, but it should be stressed that these species, like the two above, are in international trade in significant numbers (MEF, 2000; 2001).

S. gottlebei was evaluated from a conservation standpoint during the CAMP workshop (2001). The IUCN category proposed is Critically Endangered (CR) as it meets criteria B.1.a. and b.(iii).

Scaphiophryne gottlebei (BUSSE & BÖHME, 1992)

1. Taxonomy

- 1.1 Class: Amphibia
- 1.2 Order: Anoura
- 1.3 Family: Microhylidae
- 1.4 Species: *Scaphiophryne gottlebei* BUSSE & BÖHME, 1992
- 1.5 Scientific synonyms:
- 1.6 Common names: French:
English: Gottlebe's microhylid frog
Spanish:
Malagasy Sahon'orana
- 1.7 Code numbers:

2. Biological parameters

Scaphiophryne gottlebei is a burrowing and terricolous species, of medium size (the female reaches 35.7 mm), unique owing to its red dorsal colouration, with green patches marked with black. The flanks and limbs are coloured white but the rear limbs have black transverse stripes. The skin is smooth. The ends of the fingers and toes are not enlarged but the toes are webbed (Glaw & Vences, 1994). The species is active just after rainfall (CAMP, 2001).

2.1 Distribution

Country of origin: Madagascar

In the south-west of Madagascar, in the Province of Toliary, it is found in the Vallée des Singes, Isalo, around the Isalo National Park and also in the area near to Ranohira (CAMP, 2001).

2.2 Habitat availability

This species is found in low sclerophyllous forest, on rocks or in waterways (Glaw & Vences, 1994; CAMP, 2001).

2.3 Population status

The extent of occurrence of the subpopulation is < 100 km². The area of occupancy varies between 11 and 500 km². The rate of decrease anticipated for the population over the coming 10 years is 10-19 per cent (CAMP, 2001). Consequently, the IUCN category proposed by the CAMP evaluators is Critically Endangered (CR) as it meets criteria B.1a. and b.(iii).

Trade in specimens of this species has not been subject to strict regulation [as laid down in Article II, paragraph 2(a)] aiming at avoiding a utilization incompatible with its survival.

No exact data are available on the population, but the harvesting of specimens from the wild for international trade has, or may have, a detrimental impact on the species if it exceeds, over an extended period, the level than can be continued in perpetuity. This is in line with Resolution Conf. 9.24, Annex 2 a, section Big).

2.4 Population trends

The population is tending to decrease, in the view of the specialists at the CAMP scientific workshop (2001).

2.5 Geographic trends

The possible range of the species is around the Isalo National Park, central-western Madagascar (CAMP, 2001).

2.6 Role of the species in its ecosystem

It is an insectivorous species (Busse & Boehme, 1992) and may also be the prey of snakes or other carnivorous animals (Blommers-Schlösser & Blanc, 1991).

2.7 Threats

There is heavy trade in living specimens of this species: 1,753 specimens were exported in the year 2000 and 1,134 in 2001 (MEF, 2000; 2001). As its life depends on the forest and water points (CAMP, 2001), habitat destruction will negatively impact on the species' survival.

3. Utilization and trade

3.1 Domestic use

No data available.

3.2 Legal international trade

The data referred to above on exports show that all of those living specimens were exported under supervision and with permits (MEF, 2000; 2001).

3.3 Illegal trade

No data available.

3.4 Actual or potential trade impacts

The rate of decrease in habitat estimated for the coming 10 years is < 20 per cent. This is due to bush fires and the effects of cattle wandering through the forest. Under the effect of this rate, the population is likely to diminish by 10-19 per cent over the coming 10 years (CAMP, 2001). If in addition to this the intense harvesting for commercial purposes continues, this decrease in the population will be accelerated.

3.5 Captive breeding for commercial purposes

There are captive-breeding centres in Detroit, in Oklahoma and in San Diego (CAMP, 2001).

4. Conservation and management

4.1 Legal status

4.1.1 National

Destruction of the forest is prohibited in the range of the species, which falls within or lies close to the Protected Area (CAMP, 2001). The species is not protected by any national law, but harvesting or exporting require permits.

4.1.2 International

There has been no protection under IUCN or under CITES but the CAMP evaluators suggested the IUCN status Critically Endangered (CR).

Because of the high volume of exports and the restricted area of distribution, the rarity of the species and the vulnerability of the habitat, it is proposed that *Scaphiophryne gottlebei* should be listed in Appendix II.

4.2 Species management

4.2.1 Population monitoring

No data available.

4.2.2 Habitat conservation

Destruction of the forest is prohibited within the Protected Area, where this species can be found (CAMP, 2001). As the Isalo National Park is protected, this makes it possible to conserve the area of distribution of the species at the same time.

4.2.3 Management measures

None in existence.

4.3 Control measures

4.3.1 International trade

No control measures at this level.

4.3.2 Domestic measures

No such measures in existence.

5. Information on similar species

This is a very specific species unlike any others.

6. Other comments

It is recommended that research should be undertaken in order to augment the biological and ecological data on the species. The threats are reversible (CAMP, 2001). The opinion of the various specialists is to suggest that the population status and trends should be evaluated urgently.

7. Additional remarks

8. References

Busse, K. & W. Boehme, 1992. Two remarkable frog discoveries of the genera Mantella (Ranidae: Mantellinae) and Scaphiophryne (Microhylidae: Scaphiophryne) from the west coast of Madagascar. Revue fr. Aquariol., 19 (1992), 1 et 2, 31 août 1992.

CBSG Conservation Council, 2001. Evaluation et Plan de Gestion pour la Conservation (CAMP) de la Faune de Madagascar: Lémuriens, Autres Mammifères, Reptiles et Amphibiens, Poissons d'eau douce et Evaluation de la Viabilité des Populations et des Habitats de *Hypogeomys antimena* (Vositse). Reptiles et Amphibiens. Version préliminaire de l'atelier scientifique tenu le 20 à 25 mai 2001 à Mantasoa, Madagascar.

Glaw, F. & M. Vences, 1994. A Field Guide to the Amphibians and Reptiles of Madagascar. Second edition including mammals and freshwater fish. Moos Druck, Leverkusen and FARBO, Cologne

MEF, 2000. Rapport Annuel 2000 de l'Organe de Gestion CITES de Madagascar, des animaux non-CITES. Antananarivo Madagascar

MEF, 2001. Données de base de l'Organe de Gestion CITES de Madagascar Année 2001 des animaux non-CITES. Antananarivo Madagascar

Rahagalala, T. & Randrianasolo, H., 2001. Le statut des espèces de flore et de faune Malagasy sujettes au commerce international et la mise en place d'une base de données permanente. Rapport final. The Wildlife Conservation Society. Antananarivo Madagascar

Scaphiophryne pustulosa (ANGEL & GUIBE, 1945)

1. Taxonomy

- 1.1 Class: Amphibia
- 1.2 Order: Anoura
- 1.3 Family: Microhylidae
- 1.4 Species: *Scaphiophryne pustulosa* ANGEL & GUIBE, 1945
- 1.5 Scientific synonyms: *Pseudohemismus pustulosus* ANGEL & GUIBE, 1945
- 1.6 Common names:
- | | |
|-----------|---------------------------|
| French: | |
| English: | Pustulous microhylid frog |
| Spanish: | |
| Malagasy: | Sahon'orana |
- 1.7 Code numbers:

2. Biological parameters

This is a burrowing frog of medium size varying between 41 and 50 mm. Sexual dimorphism is shown by the size of the male, which is smaller than the female (Vences *et al.*, in press). The olive-tinged grey colouration on the dorsum, with large brown paravertebral patches, is marked by a median patch, enlarged into a 'T' over the eye-sockets. The ventral surface is whitish, with irregular brown spots, darker on the males. The vent is bordered by two oblique patches (Blommers-Schlösser & Blanc, 1991). The texture of the dorsal skin is granular. The ends of the fingers and toes are not particularly developed. No webbing on the fingers. The tibiotarsal articulation reaches the insertion of the forelimbs into the body (Vences *et al.*, in press).

2.1 Distribution

Country of origin: Madagascar

This species is found in Ankaratra (Blommers-Schlösser & Blanc, 1991), Manjakatombo, Itremo and Ambohitombo (Vences *et al.*, in press)

2.2 Habitat availability

S. pustulosa lives either in the rainforest above 1,700 m, or in the savannah from 2,000 m upwards, or alternatively in cultivated fields and swamps outside the forest (Glaw & Vences, 1994; Vences *et al.*, in press).

2.3 Population status

This is not yet known.

2.4 Population trends

These data do not yet exist.

2.5 Geographic trends

No information available.

2.6 Role of the species in its ecosystem

Like all amphibians, this species is insectivorous (Blommers-Schlösser & Blanc, 1991).

2.7 Threats

Thousands of specimens of this species have been exported in each of the past two years: 1,775 in 2000 and 1,008 in 2001 (MEF, 2000; 2001). This significant volume of exports calls for protective measures to be taken for the species. With regard to habitat, this species does not appear very demanding, since it is able to live both in the rainforest and in high savannahs, as well as in cultivated fields outside the forest.

3. Utilization and trade

3.1 Domestic use

No data available.

3.2 Legal international trade

All of the specimens exported in 2000 and 2001 had authorizations and permits (MEF, 2000; 2001).

3.3 Illegal trade

No data available.

3.4 Actual or potential trade impacts

On the one hand, the area of distribution of this species is somewhat localized around the central region of Madagascar. On the other hand, information on reproductive biology is not yet available (Glaw & Vences, 1994), except that incubation appears to be of short duration (under three days) (Vences *et al.*, in press). The impact of harvesting specimens from the wild and also of the trade in them cannot be determined at present, but in line with the criterion of Annex 2 a, section B. i), harvesting of these specimens from the wild for international trade may have a detrimental effect on the species if it exceeds, over an extended period, the level that can be continued in perpetuity.

3.5 Captive breeding for commercial purposes

Non-existent.

4. Conservation and management

4.1 Legal status

4.1.1 National

This status does not exist since neither the habitat nor the species is covered by any conservation status.

4.1.2 International

In the IUCN context, the status of this species has never been evaluated or proposed.

On the other hand, in the CITES context, the WWF has already proposed that it should be listed in Appendix I on the grounds of the considerable volume of exports, the rarity of the species and the vulnerability of the habitat (Randrianasolo & Rahagalala, 2001). At present, it is recommended that *S. pustulosa* should be listed in Appendix II owing to the lack of sufficient biological and ecological data.

4.2 Species management

4.2.1 Population monitoring

This does not yet exist.

4.2.2 Habitat conservation

In practice, there is no habitat conservation. Furthermore, the cultivated fields where the species can be found (Razarihelisoa, 1979, in Vences *et al.*, in press) are not protected.

4.2.3 Management measures

None in existence.

4.3 Control measures

4.3.1 International trade

There are not yet any control measures at international level.

4.3.2 Domestic measures

These measures do not yet exist.

5. Information on similar species

Similar species: *Scaphiophryne madagascariensis* BOULENGER, 1882

Since they can be confused, this will also cause a threat to *Scaphiophryne madagascariensis*.

6. Other comments

7. Additional remarks

A publication is imminent on the study of the development of the embryo and the tadpoles (Vences, M. *et al.*, in press).

8. References

Blommers-Schlösser R. M. A. & Ch. P. Blanc, 1991. Faune de Madagascar 75(1). Amphibiens (première partie). Muséum National d'Histoire naturelle.

Glaw, F. & M. Vences, 1994. A Field Guide to the Amphibians and Reptiles of Madagascar. Second edition including mammals and freshwater fish. Moos Druck, Leverkusen and FARBO, Cologne

MEF, 2000. Rapport Annuel 2000 de l'Organe de Gestion CITES de Madagascar, des animaux non-CITES. Antananarivo Madagascar

MEF, 2001. Données de base de l'Organe de Gestion CITES de Madagascar Année 2001 des animaux non-CITES. Antananarivo Madagascar

Rahagalala, T. & Randrianasolo, H., 2001. Le statut des espèces de flore et de faune Malagasy sujettes au commerce international et la mise en place d'une base de données permanente. Rapport final. The Wildlife Conservation Society. Antananarivo Madagascar

Vences, M. *et al.*, in press. Amphibians and reptiles of the Ankaratra Massif: reproductive diversity, biogeography and conservation of a montane fauna in Madagascar. Italian Journal of Zoology

Scaphiophryne madagascariensis (BOULENGER, 1882)

1. Taxonomy

- 1.1 Class: Amphibia
- 1.2 Order: Anoura
- 1.3 Family: Microhylidae
- 1.4 Species: *Scaphiophryne madagascariensis* BOULENGER, 1882
- 1.5 Scientific synonyms: *Calophrynus madagascariensis* BOULENGER, 1882
- 1.6 Common names: French:
English:
Spanish:
Malagasy Sahona
- 1.7 Code numbers:

2. Biological parameters

This is a burrowing frog of medium size, approximately 55 mm. The dorsal colouration is olive-tinged or grey-tinged with large brown island-like blotches, clearly outlined. There is a triangular patch between the eyes, the point of which extends on to the dorsum. The ventral surface of the body and the limbs is marbled in black (Blommers-Schlösser & Blanc, 1991). The dorsal tegument is finely granular. The tibiotarsal articulation reaches the insertion of the forelimbs into the body. The ends of the fingers are blunt and the fourth finger is longer than the second. Unlike the hands, the feet are webbed (Glaw & Vences, 1994). The male is distinguished by its blackish and well-developed median vocal sac and its strongly granular throat while the abdomen and the inside surface of the hind limbs are finely granular (Blommers-Schlösser & Blanc, 1991).

2.1 Distribution

Country of origin: Madagascar

This species is found to the east of Fianarantsoa. The species known as *S. madagascariensis* and found in the massif of Andringitra above altitudes of 2,000 m is a different species altogether (Vences *et al.*, in press).

2.2 Habitat availability

The habitat occupied by the adult *S. madagascariensis* is not well-known, but tadpoles have been found in ponds in open areas, and others in savannahs at the edge of forests, as well as in secondary vegetation (Glaw & Vences, 1994). This suggests that the adults also live in this type of secondary habitat.

2.3 Population status

This is not yet known. No accurate data are available on the population but the specimens of *S. madagascariensis* resemble those of *S. pustulosa* (Vences *et al.*, in press). The latter has been put forward for listing in Appendix II in accordance with Article II, paragraph 2(a), of the Convention. These species are so similar that it is unlikely that a non-expert, with reasonable effort, would be

able to distinguish between them. This meets the criterion for listing *S. madagascariensis* in Appendix II, in accordance with Resolution Conf. 9.24, Annex 2 b, section A.

2.4 Population trends

These data do not yet exist. However, general opinion notes that bush fires are rife in the range of this species (Glaw & Vences, 1994); the population is thus tending to diminish but the rate of decrease has not yet been estimated.

2.5 Geographic trends

No information available.

2.6 Role of the species in its ecosystem

Like all amphibians, this species is insectivorous and may be the prey of snakes or other carnivorous animals (Blommers-Schlösser & Blanc, 1991).

2.7 Threats

Since bush fires are rife in the range of the species, this is one threat to its survival. On the other hand, a large number of *S. madagascariensis* (1,137 specimens) were exported in 2000. The volume was much reduced in 2001, with 387 specimens exported. (MEF, 2000; 2001). The following table shows the numbers of specimens exported from Madagascar and indicates the importing countries.

Table I: Exports of *Scaphiophryne madagascariensis* from Madagascar to various countries (2000 and 2001)

Year / Country	Germany	UK	Spain	Japan	Thailand	USA	Total
2000	56		24	125		932	1137
2001		62			50	275	387

(Source: MEF- CITES Management Authority, Madagascar: Report for the Year 2000 on non-CITES Animals; Basic Data for 2001 on non-CITES Animals)

The USA is the major importing country. Its quota has been reduced to less than a third over the course of the past two years.

3. Utilization and trade

3.1 Domestic use

No data available.

3.2 Legal international trade

All of the specimens exported in 2000 and 2001 had authorizations and permits (MEF, 2000; 2001).

3.3 Illegal trade

No data available.

3.4 Actual or potential trade impacts

The area of distribution of this species is located to the east of Fianarantsoa. Data on reproductive biology are not available yet (Glaw & Vences, 1994). The impact of harvesting of specimens from the wild and trade in them cannot be determined at present, but in accordance with the criterion of Annex 2a, section B. i), the harvesting of these specimens from the wild for international trade may have a detrimental impact on the species if it exceeds, over an extended period, the level that can be continued in perpetuity.

3.5 Captive breeding for commercial purposes

Non-existent.

4. Conservation and management

4.1 Legal status

4.1.1 National

This status does not exist since neither the habitat nor the species is covered by any conservation status.

4.1.2 International

S. madagascariensis has never been covered by an IUCN or CITES conservation status.

4.2 Species management

4.2.1 Population monitoring

This does not yet exist.

4.2.2 Habitat conservation

In practice, there is no conservation in the range of the species, where the habitat is in secondary vegetation.

4.2.3 Management measures

None in existence.

4.3 Control measures

4.3.1 International trade

There are not yet any control measures at international level.

4.3.2 Domestic measures

These measures do not yet exist.

5. Information on similar species

Similar species: *Scaphiophryne pustulosa* ANGEL & GUIBE, 1945.

6. Other comments

As accurate biological and ecological data are currently insufficient, the general view of the specialists was to make recommendations for research.

Even though *Scaphiophryne madagascariensis* is widely-distributed by comparison with the two preceding species (Glaw, F. & M. Vences, 1994), the development of international trade will threaten its long-term survival as well as that of the others. Listing of the species in Appendix II has therefore been recommended.

7. Additional remarks

8. References

Blommers-Schlösser R. M. A. & Ch. P. Blanc, 1991. Faune de Madagascar 75(1). Amphibiens (première partie). Muséum National d'Histoire naturelle.

Glaw, F. & M. Vences, 1994. A Field Guide to the Amphibians and Reptiles of Madagascar. Second edition including mammals and freshwater fish. Moos Druck, Leverkusen and FARBO, Cologne

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MEF, 2001. Données de base de l'Organe de Gestion CITES de Madagascar Année 2001 des animaux non-CITES. Ministère des Eaux et Forêts Antananarivo Madagascar

Vences, M. et al., in press. Amphibians and reptiles of the Ankaratra Massif: reproductive diversity, biogeography and conservation of a montane fauna in Madagascar. Italian Journal of Zoology

Scaphiophryne marmorata (BOULENGER, 1882)

1. Taxonomy

- 1.1 Class: Amphibia
- 1.2 Order: Anoura
- 1.3 Family: Microhylidae
- 1.4 Species: *Scaphiophryne marmorata* BOULENGER, 1882
- 1.5 Scientific synonyms: *Scaphiophryne spinosa* STEINDACHNER, 1882
- 1.6 Common names:
- | | |
|-----------|------------------------|
| French: | |
| English: | Marmor microhylid frog |
| Spanish: | |
| Malagasy: | Sahona |
- 1.7 Code numbers:

2. Biological parameters

This is a burrowing frog of medium size, varying between 35 and 50 mm. The olive-tinged colouration on the back, greenish but sometimes shading to a bluish tinge, is marked by large irregular blotches. The ventral surface has brown marbling on a yellow background. Sexual dimorphism is shown by the male's throat of a uniformly blackish colour and its dorsal teguments, which become spiny in the mating season (Blommers-Schlösser & Blanc, 1991). The dorsal skin is granular in texture. The finger pads are large. The fourth finger is longer than the first and the second. No webbing on the fingers. The tibiotarsal articulation reaches the tympanum (Blommers-Schlösser & Blanc, 1991; Glaw & Vences, 1994).

2.1 Distribution

Country of origin: Madagascar

This species is widely distributed on the east coast of Madagascar and in the Tsingy de Bemaraha reserve. It is generally found at altitudes over 1,000 m (Blommers-Schlösser & Blanc, 1991; Glaw & Vences, 1994).

2.2 Habitat availability

S. marmorata has been observed in the rainforest of Andasibe near stagnant water (Glaw & Vences, 1994; Vences *et al.*, in press).

2.3 Population status

This is not yet known.

2.4 Population trends

These data do not yet exist.

2.5 Geographic trends

No information available.

2.6 Role of the species in its ecosystem

Like all amphibians, this species is insectivorous and may be the prey of snakes or other carnivorous animals (Blommers-Schlösser & Blanc, 1991).

2.7 Threats

Thousand of specimens of this species have been exported in each of the past two years: 1,833 in 2000 and 2,918 in 2001 (MEF, 2000; 2001). The increase in the volume of exports calls for protective measures to be taken for the species. Table II below shows the increase in the numbers of specimens exported annually.

Table II: Exports of *S. marmorata* from Madagascar to various countries (2000-2001)

Year/ Country	Germany	Belgium	Canada	UK	Spain	France	Netherlands	Hungary	Japan	Switzer -land	Switzerland	Thailand	UK	USA	Nevada	Total
2000	50	50			14	20	40	156	6	20	10	70	20	1357	20	1833
2001	310	10	300	50	225		200	58				50	110	1605		2918
Total	360	60	300	50	239	20	240	214	6	20	10	120	130	2962	20	4751

(Source: Source: MEF- CITES Management Authority, Madagascar: Report for the Year 2000 on non-CITES Animals; Basic Data for 2001 on non-CITES Animals)

3. Utilization and trade

3.1 Domestic use

No data available.

3.2 Legal international trade

All of these non-CITES animals, exported in the years 2000 and 2001, had authorizations and permits (MEF, 2000; 2001).

3.3 Illegal trade

No data available.

3.4 Actual or potential trade impacts

This species is widely distributed on the east coast of Madagascar and in the Tsingy de Bemaraha reserve. It is generally found at altitudes over 1,000 m (Blommers-Schlösser & Blanc, 1991; Glaw & Vences, 1994).

Neither the type of habitat nor the reproductive biology of *S. marmorata* is well known. It is widely distributed by comparison with the other species, but as it is a forest species, it is threatened by habitat disturbance (Glaw & Vences, 1994). The impact of harvesting of specimens from the wild and trade in them cannot be determined at present, but in accordance with the criterion of Annex 2 a, section B. i), the harvesting of these specimens from the wild for international trade may have a detrimental impact on the species if it exceeds, over an extended period, the level that can be continued in perpetuity.

3.5 Captive breeding for commercial purposes

Non-existent.

4. Conservation and management

4.1 Legal status

4.1.1 National

This status does not exist since neither the habitat nor the species are covered by any conservation status.

4.1.2 International

In the IUCN context, the status of this species has never been evaluated or proposed. At the present time, it is proposed that it should be listed in Appendix II owing to the significant volume of exports and the destruction of the species' habitat.

4.2 Species management

4.2.1 Population monitoring

This does not yet exist.

4.2.2 Habitat conservation

In practice, there is no habitat conservation, except in the Tsingy de Bemaraha National Park.

4.2.3 Management measures

None in existence.

4.3 Control measures

4.3.1 International trade

There are not yet any control measures at international level.

4.3.2 Domestic measures

These measures do not yet exist.

5. Information on similar species

No data available.

6. Other comments

Even though *Scaphiophryne marmorata* is widely-distributed by comparison with the first two species above (Glaw, F. & M. Vences, 1994), the development of international trade will threaten its long-term survival as well as that of the others. Further research is necessary to augment the existing data.

7. Additional remarks

8. References

Blommers-Schlösser R. M. A. & Ch. P. Blanc, 1991. Faune de Madagascar 75(1). Amphibiens (première partie). Muséum National d'Histoire naturelle.

Glaw, F. & M. Vences, 1994. A Field Guide to the Amphibians and Reptiles of Madagascar. Second edition including mammals and freshwater fish. Moos Druck, Leverkusen and FARBO, Cologne

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