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## ARTICLES

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### Notes on the Distribution of *Dyscophus insularis* (Anura: Microhylidae)

MIGUEL VENCES

Muséum national d'Histoire naturelle, Laboratoire des Reptiles et Amphibiens  
25 rue Cuvier, 75005 Paris, France

Address for correspondence: Zoologisches Forschungsinstitut und Museum  
Alexander Koenig, Adenauerallee 160, D-53113 Bonn, Germany  
e-mail: m.vences@t-online.de

FRANK GLAW

Zoologische Staatssammlung, Münchenstr. 21  
D-81247 München, Germany

e-mail: Frank.Glaw@zsm.mwn.de

and

BRIAN L. FISHER

Department of Entomology, California Academy of Sciences  
Golden Gate Park, San Francisco, California 94118, USA

e-mail: bfisher@calacademy.org

industry. Todd Capson and Phyllis Coley, in collaboration with the Smithsonian Tropical Research Institute, are spearheading this project, in which Panamanians are trained to carry out important chemical assays (such as those for anti-cancer and anti-HIV properties). By identifying such properties before the plants (or plant extracts) are sold to the pharmaceutical companies, their economic value to the people of the country of origin is vastly increased. The recent development of an extremely potent painkiller from the toxins of a poison frog from Ecuador (Bradley 1993) highlights the benefits that the identification of potentially useful compounds from the tropical forest could provide to people from the countries of origin, if they are able to participate in the process of discovery.

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*Dyscophus insularis* is one of three species in the endemic Malagasy genus *Dyscophus*, which together with the Asian genus *Calluella* forms the subfamily *Dyscophinae* (family *Microhylidae*). While *D. antongili* and *D. guineti* are exclusively known from humid eastern Madagascar, *D. insularis* is largely a species of the seasonal dry areas of western Madagascar. It was recorded from five western localities by Blommers-Schlösser and Blanc (1991): the type locality Antsohy near Trabouzy, Belo (type locality of the synonym *beloensis*), Tsimanampetsotsa and Soalala (localities of the type series of the synonym *quinquelineatum*; Soalala being the locality of the lectotype), and Ankarafantsika. Glaw and Vences (1994) added two additional records, Ambanja in the north-west (voucher specimen in Zoologisches Forschungsinstitut und Museum A. Koenig, Bonn: ZFMK 52757) and Kirindy in the west (based on personal communications; vouchers collected in 1995: ZFMK 59982–59984). Emanuelli and Jesu (1995) recorded the species from the Tsingy de Bemaraha, Goodman et al. (1997) from the Vohibasia forest. One additional locality in Blommers-Schlösser and Blanc (1991) does not fit into this distributional pattern, namely Marojezy in the rainforest area of north-eastern Madagascar. This locality was based on specimens in the Muséum National d'Histoire Naturelle, Paris (MNHN) already mentioned by Guibé (1978).

In the MNHN collection, we located five specimens of *D. insularis* with the origin Marojezy (MNHN 1973.577–581). Altitude of the collecting locality is given as 1300 m in the catalogue (not 300 m as reported by Guibé 1978) and collecting date as 2 July 1972. In the catalogue, this series is immediately followed by nine specimens (MNHN 1973.582–590) from Ankarafantsika (Ampijoroa), collected on 5 February 1973. No information on the collector(s) is given. According to entry notes of J. Guibé available in the MNHN, the specimens belonged to a large series of microhylids from “Massif de Marojezy et autres lieux” which were collected by C. P. Blanc. The *Dyscophus* specimens had the provisional numbers 2084–2092 and 2094–2098 and are marked in the

notes with the locality information "region Ouest." In a second notebook containing a list of the provisional numbers, the whole series 2082–2092 and 2094–2118 (comprising also other species) are explicitly stated to originate from Ankarafantsika, collected on 5 February 1973. Apparently, the locality information Marojezy for *D. insularis* is thus an error that occurred when the specimens were catalogued. To evaluate further evidence on the locality of these specimens, we examined the respective vouchers in more detail.

All specimens of both series are very similar regarding their (good) state of preservation, fixation, external morphology, and coloration. MNHN 1973.578 is an adult female (SVL 52.8 mm) containing 1100 mature blackish oocytes of 1–1.2 mm diameter, indicating that at least this specimen was captured during the reproductive season. Examining stomach contents, we observed three conspicuous items present in specimens from both series: a) Remains of a large ensiferan orthopteran in MNHN 1973.581 (Marojezy) almost certainly corresponding to undetermined but better preserved prey items in MNHN 1973.585 and 586 (Ankarafantsika); b) In MNHN 1973.578 (Marojezy) we found three abdomina of a tenebrionid coleopteran which were identical to a remain in MNHN 1973.590 and to a completely preserved specimen in MNHN 1973.587 (both Ankarafantsika); the beetle was determined as *Parecatus machloides* (Tenebrionidae: Asidinae), a conspicuous form which we did not see in any other stomach of about 200 Malagasy frogs examined from different localities; c) Stomach of MNHN 1973.579 (Marojezy) contained remains of the ant *Aphenogaster swammerdami*, a species that was also found in MNHN 1973.586 and 1973.588–589 (Ankarafantsika). Stomachs of specimens of both series contained sand.

*Dyscophus insularis* is a species breeding in lentic water and is known mainly from open areas of sandy soils. The ant *Aphenogaster swammerdami* is a species limited to open areas and is very common in the western dry forest habitats, although it also can be found in disturbed and secondary grassland habitats in the eastern high plateau (BLF, unpublished data). Marojezy is a mountain massif largely covered by primary rainforest; only above 1800–2000 m altitude the forest is replaced by open ericoid heathlands (Raselimanana et al. 2000). The MNHN *Dyscophus* specimens from Marojezy are reported as originating from altitudes of 1300 m (MNHN catalogue) or 300 m (Guibé 1978), which are covered by forest. It is very unlikely that this information is correct, considering the habitat preferences of *D. insularis* and its prey *A. swammerdami*. Furthermore, it also is not probable that an explosive breeder like *D. insularis* would reproduce in the cold and dry season (July) as suggested by the presumed collecting date and the oocytes found in MNHN 1973.578. The intensive surveys of Raselimanana et al. (2000) failed to record *D. insularis* from Marojezy, despite the use of pitfall trapping which is suited for the capture of terrestrial microhylids. Considering also the conspicuous agreement between stomach content composition, there is overwhelming evidence that the Marojezy entry in the MNHN catalogue is erroneous, and that the respective *D. insularis* specimens belong to the same series as MNHN 1973.582–590 and were thus collected at Ankarafantsika.

This removes one anomalous biogeographic pattern in the distribution of Malagasy anurans. It also stresses the endemism of

the amphibian fauna of western Madagascar, and bears relevance for conservation. If *D. insularis* is not present in the Marojezy reserve, it is currently known from only three officially protected areas, namely Ankarafantsika, Tsingy de Bemaraha, and Tsimanampetsotsa (although its occurrence within the boundaries of the latter reserve are still to be confirmed).

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## Advertisement Call and Breeding Period of the Frog, *Kaloula pulchra* (Microhylidae)

RAVISHANKAR D. KANAMADI

Department of Zoology, Karnatak University,  
Dharwad-580 003, India  
e-mail: karuni@gbl.vsnl.net.in

GIRISH G. KADADEVARU

Department of Zoology, Karnatak University,  
Dharwad-580 003, India

and

HANS SCHNEIDER

Zoologisches Institut, University of Bonn, Bonn, Germany  
e-mail: Dr.Schneider@gmx.net

The Western Ghats region of India has been identified as one of the 18 biodiversity hot spots of the world (WCMC 1988), and harbors 205 species of amphibians (Daniels 1992). *Kaloula pulchra* is a medium-sized burrowing frog (mean male SVL = 67.3 mm, N = 10) distributed in parts of Western Ghats. Although *K. pulchra* is a common microhylid of this region, we have limited knowledge about this species from the Western Ghats. In particular, very little is known about its reproductive biology. We investigated the