

## The identity of *Mantella cowani* Boulenger, 1882 and *Mantella haraldmeieri* Busse, 1981 (Anura: Mantellinae)

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**Abstract.** The synonymization of *Mantella madagascariensis haraldmeieri* Busse, 1981 with *M. cowani* Boulenger, 1882 by Blommers-Schlösser and Blanc (1991) is unjustified. Re-examination of the type material and descriptions demonstrates the specific distinctness of both, regardless the possibility that *cowani* and other nominal taxa commonly considered as synonyms of *M. madagascariensis* are actually taxonomically distinct from the latter.

### Introduction

*Mantella haraldmeieri* was described by Busse (1981) on the basis of 6 specimens originating from the vicinity of Fort Dauphin (= Taolagnaro) on the south coast of Madagascar. He originally classified this frog as a subspecies of *Mantella madagascariensis* (Grandidier, 1872), a highly variable species the name of which antedates and therefore had to replace *M. cowani* Boulenger, 1882 sensu lato, as used by Guibé (1964, 1978); see also Busse (op. cit.). Meier (1986) suspected that further material, particularly living specimens could well demonstrate *haraldmeieri* to be a full species, when compared with *M. madagascariensis* (including its synonym *cowani* s.l., see above). This viewpoint was substantially corroborated by Pintak (1990). His study combined "classical" morphological characters with new karyological data and led to a first phylogenetic analysis of the genus using *Trachymantis* (= *Laurentomantis*) and *Mantidactylus* as outgroups. In his cladogram *M. haraldmeieri* formed a monophyletic group with *M. betsileo* and *M. viridis*, defined by the following synapomorphies: reduction of the portion of the small chromosomes within the haploid genome to less than 38.5%; enlargement of chromosome no. 1 to a portion of at least 15.5% of the haploid genome. Autapomorphically *M. haraldmeieri* is defined by its small calfspots at the insertion of the limbs which, according to Pintak (op. cit.) are not comparable (homologous?) with those of *M. madagascariensis*, by numerous small, sometimes indistinct whitish dots on the dorsum, a characteristic dark dorsal

colour pattern, and by the absence of a frenal stripe. Pintak's (op. cit.) phylogenetic arrangement places *M. madagascariensis* as the sister taxon of *M. crocea* plus *M. aurantiaca*, thus underlining the phylogenetic distance and — by additional implication — specific distinctness of both *haraldmeieri* and *madagascariensis*.

### Synonym or valid taxon?

Blommers-Schlösser and Blanc (1991) recently synonymized *M. haraldmeieri* Busse, 1981 with *M. cowani* Boulenger, 1882, maintaining, however, *M. madagascariensis* (Grandidier, 1872) as a valid species. Thus, their nomenclatural action was twofold: (1) they removed *cowani* from the synonymy of *madagascariensis* and revived it as a distinct species, and (2) relegated the taxon *haraldmeieri* to the synonymy of the just resurrected *cowani*. Their reasons for these two actions, with which we strongly disagree (see Busse and Böhme 1992: 60), have to be reconsidered separately:

1. In their identification key, Blommers-Schlösser and Blanc (op. cit.: 264) distinguish *M. cowani* from *M. madagascariensis* by the following alternative: "Replis dorso-latéraux de l'oeil à l'aîne. Coloration entre les replis brunâtre ou grisâtre" (*cowani*) versus "pas de replis dorso-latéraux. Coloration très variable" (*madagascariensis*). This distinction, however, cannot be deduced from the two existing syntypes of *cowani* (B.M. 1947.2.27.4: see fig. 103 on pl. 9 in Blommers-Schlösser and Blanc op. cit.; and B.M. 1947.2.27.5: see fig. 1, this paper) although one of them has been figured by the two authors. Both syntypes and three additional specimens from the Berlin Museum (ZMB

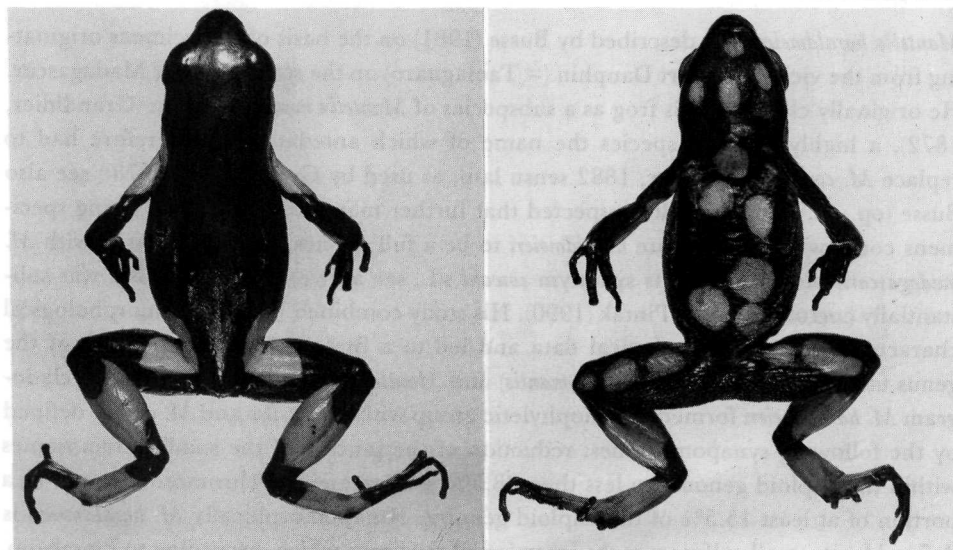
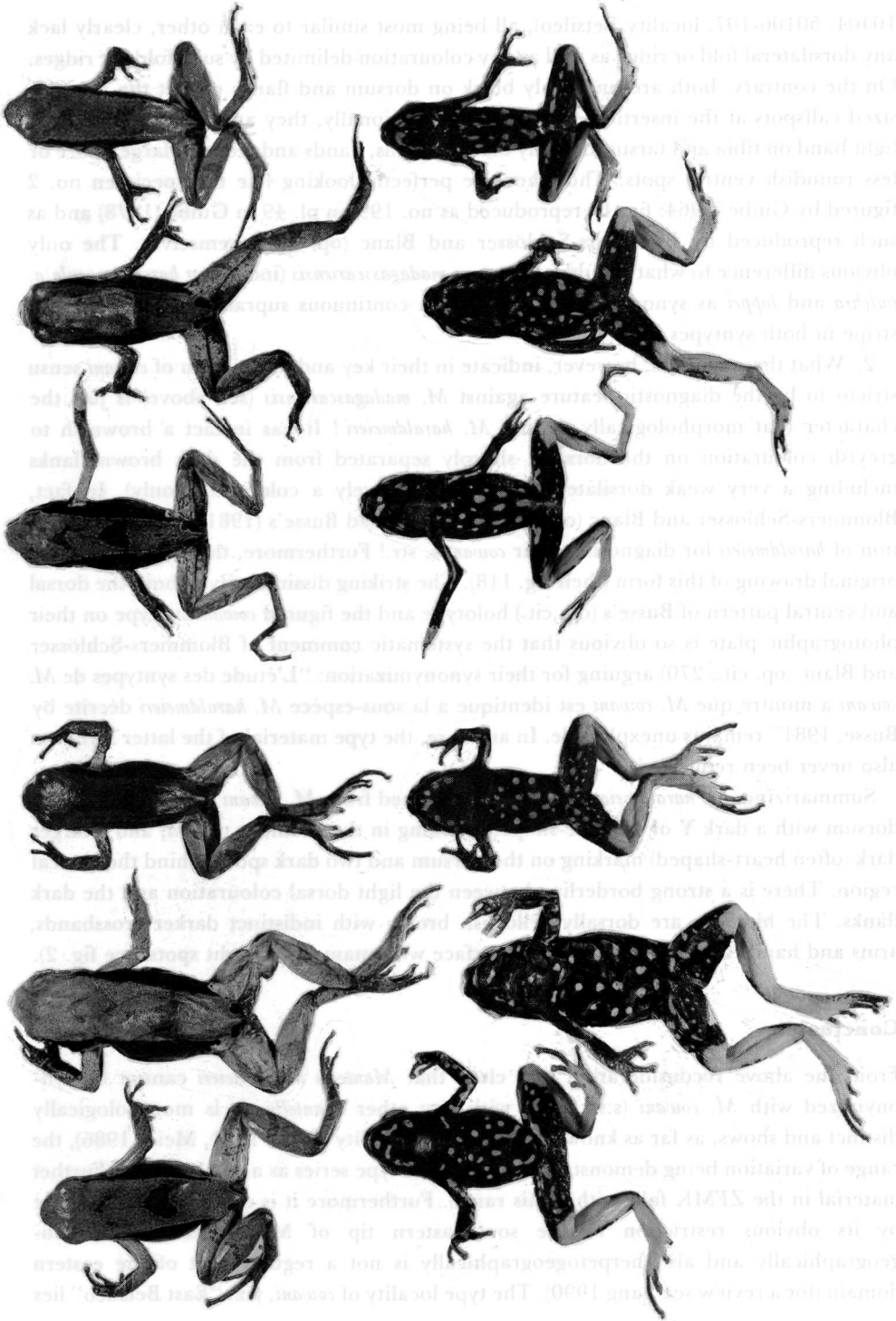


Figure 1. Syntype BM 1947.2.27.5 of *Mantella cowani* Boulenger, 1882 in dorsal and ventral view.



10404, 50106-107, locality Betsileo), all being most similar to each other, clearly lack any dorsilateral fold or ridge as well as any colouration delimited by such folds or ridges. On the contrary, both are uniformly black on dorsum and flanks except the medium sized calfsots at the insertion of the limbs. Additionally, they are characterized by a light band on tibia and tarsus, dorsally blackish arms, hands and feet and large, more or less roundish ventral spots. Thus they are perfectly looking like the specimen no. 2 figured by Guibé (1964: fig. 1), reproduced as no. 199 on pl. 49 in Guibé (1978) and as such reproduced by Blommers-Schlösser and Blanc (op. cit.) themselves. The only obvious difference to what should be the true *madagascariensis* (including *baroni*, *maculata*, *pulchra* and *loppei* as synonyms) is the lack of a continuous supraocular/canthal light stripe in both syntypes.

2. What these authors, however, indicate in their key and description of *cowani* sensu stricto to be the diagnostic feature against *M. madagascariensis* (see above) is just the character that morphologically defines *M. haraldmeieri*! It has in fact a brownish to greyish colouration on the dorsum, sharply separated from the dark brown flanks including a very weak dorsilateral fold (being merely a colour line only). In fact, Blommers-Schlösser and Blanc (op. cit.) obviously used Busse's (1981) original description of *haraldmeieri* for diagnosing their *cowani* s. str.! Furthermore, they reproduced his original drawing of this form (their fig. 118). The striking dissimilarity of both the dorsal and ventral pattern of Busse's (op. cit.) holotype and the figured *cowani* syntype on their photographic plate is so obvious that the systematic comment of Blommers-Schlösser and Blanc (op. cit.: 270) arguing for their synonymization: "L'étude des syntypes de *M. cowani* a montré que *M. cowani* est identique à la sous-espèce *M. haraldmeieri* décrite by Busse, 1981" remains unexplicable. In any case, the type material of the latter form has also never been requested.

Summarizing, *M. haraldmeieri* can be distinguished from *M. cowani* by the light brown dorsum with a dark Y or triangle-shaped marking in the shoulder region, and a larger dark (often heart-shaped) marking on the dorsum and two dark spots behind the cloacal region. There is a strong borderline between the light dorsal colouration and the dark flanks. The hindlegs are dorsally yellowish brown with indistinct darker crossbands, arms and hands are also light. Ventral surface with many small light spots (see fig. 2).

## Conclusion

From the above reconsideration it is clear that *Mantella haraldmeieri* cannot be synonymized with *M. cowani* (s.str.) nor with any other *Mantella*. It is morphologically distinct and shows, as far as known, only little variability (Busse 1981, Meier 1986), the range of variation being demonstrated here by the type series as a whole (fig. 2). Further material in the ZFMK falls within this range. Furthermore it is chorologically distinct by its obvious restriction to the southeastern tip of Madagascar which zoogeographically and also herpetogeographically is not a regular part of the eastern domain (for a review see Lang 1990). The type locality of *cowani*, viz. "East Betsileo" lies

just in this eastern domain which forms a different climatic, vegetational and therefore zoogeographical distribution unit within Madagascar.

Regardless the fact that *M. haraldmeieri* is a distinct valid species, it is well possible that *M. cowani* is actually a distinct species, too; in this case, however, in close sympatry or even syntopy with the most similar *M. madagascariensis*. This highly variable species is in fact best regarded as a complex of cryptic sibling species rather than being simply one polymorphic species (Glaw and Vences 1992). But this problem, beyond the scope of this paper, can be resolved only when biosystematic characters (e.g. chromosomes, blood serum proteins, skin alkaloids, voice) can be included in the study. Any result achieved will furthermore be faced with the confusing synonymy of already existing available names. Ecological and behavioural data presented by Andreone (in press) support this assumption of a complex of sibling species within the nominal *M. madagascariensis*. A first documentation of these cryptic species in colour photos has been provided by Glaw & Vences (op. cit.). But, as pointed out before, this does not at all affect the validity and specific distinctness of *Mantella haraldmeieri* which has unjustifiedly been synonymized with *M. cowani* by Blommers-Schlösser and Blanc (op. cit.).

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