

## A new grass frog from Namibia

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Received 21 December 1992; accepted 24 February 1993

A new species of grass frog of the genus *Ptychadena* is described from northern Namibia. Although superficially similar to *Ptychadena schillukorum* and *Ptychadena mossambica*, the new species differs in advertisement call, and external characters. An examination of a series of published sonagrams indicates that *Ptychadena floweri* must be regarded as a junior synonym of *P. schillukorum*.

'n Nuwe gras padda-spesies van die genus *Ptychadena* word van noordelike Namibia beskryf. Alhoewel dit oppervlakkig soortgelyk is aan *Ptychadena schillukorum* en *Ptychadena mossambica*, is daar duidelike verskille in advertensieroep en eksterne kenmerke. 'n Onderzoek van 'n reeks sonagramme toon dat *Ptychadena floweri* 'n junior sinoniem van *P. schillukorum* is.

Grass frogs of the genus *Ptychadena* are widespread in the warm and wet areas of Africa. Although many are difficult to separate on external morphology, the species are readily separable as each produces loud and characteristic vocalizations (Passmore 1977).

Amongst a collection of frogs from the Caprivi strip in Namibia, held in the State Museum, Windhoek and the California Academy of Sciences, were some identified as *P. cotti* (= *P. schillukorum*) (Channing 1989) and believed to be a new record for the country. However, Poynton & Broadley (1991) noted that the Caprivi frogs were not conspecific with *P. schillukorum*. Superficially they resemble *P. mossambica* and *P. schillukorum*, the latter not known from Namibia. The call of the Namibian frog is quite different from both *P. mossambica* and *P. schillukorum*. On the basis of small differences in morphology and a distinct advertisement call it is described as a new species.

### *Ptychadena mapacha* n. sp.

**Holotype:** A male, collected from Mapacha (Mpacha), in the eastern Caprivi, Namibia, 17°38'S / 24°10'E, February 1986, by A. Channing. The specimen is housed in the State Museum, Windhoek, SMR 26145.

**Paratypes:** Two male paratypes are housed in the California Academy of Sciences, CAS 160535 and 160547, collected February 1986, by A. Channing, from Katima Mulilo, 17°32'S / 24°15'E.

**Diagnosis:** Externally very similar to *Ptychadena schillukorum*, with short legs and small dark markings on the dorsum. Distinguishable, in the small sample examined, by the unbroken ridge extending from the upper lip, below the tympanum, back nearly to the arm insertion (Figure 1). In *P. schillukorum* the ridge is broken. *Ptychadena mossambica* does not always possess a distinct ridge from the upper lip, and the flanks are very granular. *P. mapacha* has a few flat granules on the posterior flanks. The male advertisement call is quite distinct.

**Description of holotype.** A male, SVL 29 mm. The snout is sharp, protruding beyond the mouth. The nostrils are oval, rimmed, and situated 2 mm (40%) back from the snout to the anterior corners of the eyes. Each nostril is situated at

the anterior end of a depression formed by slight swellings of the upper lip and canthus. The eyes are small, 2 mm in diameter. The distance between the anterior corners of the eyes is equal to the snout-eye distance. The tympanum is small (2.4 mm), round, and subequal in diameter to the eye. The upper lip extends into an unbroken pale ridge below the tympanum ending just anterior to the top of the arm insertion. The vocal pouch slits are parallel to the upper lip, opening below the arm insertion. The vocal pouch is darkened anteriorly, as seen partially protruding from the vocal pouch slit. The arms are short, with large subarticular tubercles on the palms and fingers (Figure 2). Vomerine projections occur anteriorly to the internal nostrils. Maxillary teeth are visible from below, with teeth on the sides of the maxilla projecting backwards at 45° to the jaw line. The legs are short, the tibia being 14 mm, and the foot, measured to include the metatarsal tubercle, 11 mm. A pale ridge runs distally along the tarsus from the inner metatarsal tubercle. Toes partially webbed, with 2 $\frac{2}{3}$  to 3 phalanges of fourth toe free of web. The longitudinal ridges on the dorsum, characteristic of the genus *Ptychadena*, are indistinct and interrupted. Four ridges can be counted between the tympanii, and nine across the dorsum at the widest part (Figure 3). The ventrum is pale, immaculate and smooth.



Figure 1 A male *Ptychadena mapacha* n. sp. Snout-vent length 30 mm.

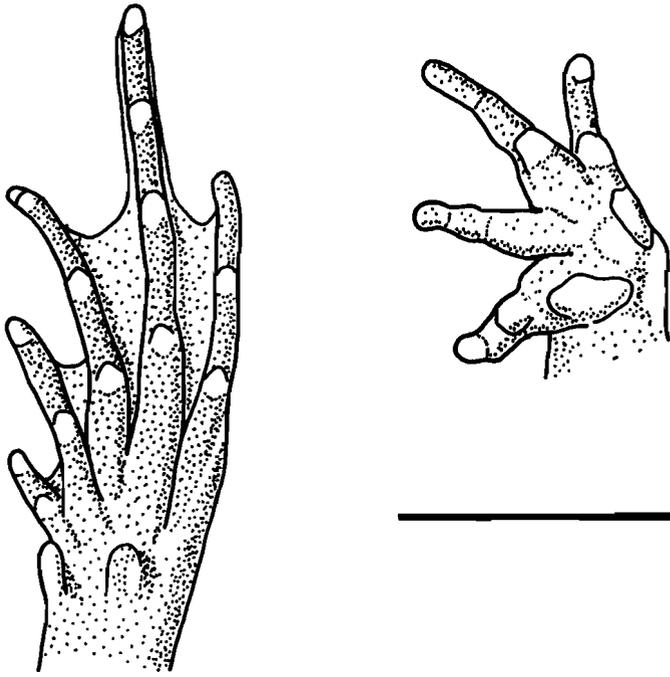


Figure 2 The lower surfaces of the hands and feet of *Ptychadena mapacha* (SMR 26145). Scale line = 5 mm.

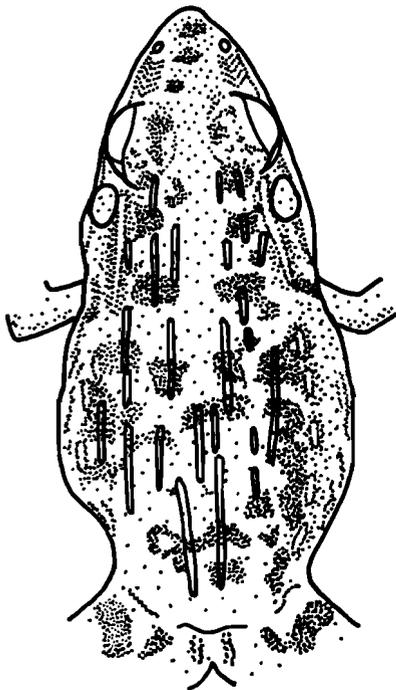


Figure 3 The dorsal pattern and longitudinal skin ridges of *Ptychadena mapacha* (SMR 26145).

Dorsal patterning consists of small, dark eye-sized markings against a shaded background. The legs are barred with two broad continuous dark bars on the anterior face of the thigh, and four broken bars across the tibia. The posterior face of the thigh is mottled, tending to form a longitudinal pale line. The posterior face of the tibia has a number of small white spots. A thin tibial line is present in CAS 160535. A pale flattened broken ridge runs from the eye to the leg insertion

Table 1 Measurements (mm) of the holotype and paratypes of *Ptychadena mapacha*

	SMR 26145	CAS 160535	CAS 160547
Snout-vent	29	29	28
Tibia	14	15	14
Foot	11	13	13
Tympanum	2,4	2,5	2,8
Ant. borders of eye	5	4,5	5,1
Snout-nostril	2	1,5	2,5
Snout-eye	5	4,5	5,6

(Figure 1). In other specimens this ridge is unbroken. A pale thin vertebral stripe is present in CAS 160535. Measurements of holotype and paratypes are listed in Table 1.

*Colour in life.* The dorsum is olive brown with dark brown spots. The ridge along the upper lip back to the arm insertion, and the ridge running backwards from the eye, are cream. Reddish-brown infusions are present behind the tympanum and on the tibia. The upper arm shows an orange-brown linge. The tympanum has a pale edge.

*Etymology.* The epithet *mapacha* is derived from the name of the area around the airfield outside Katima Mulilo. Although not part of the local language, Lozi, the word is believed to refer to the recent nature of the settlement. It is a noun in apposition.

#### Advertisement call

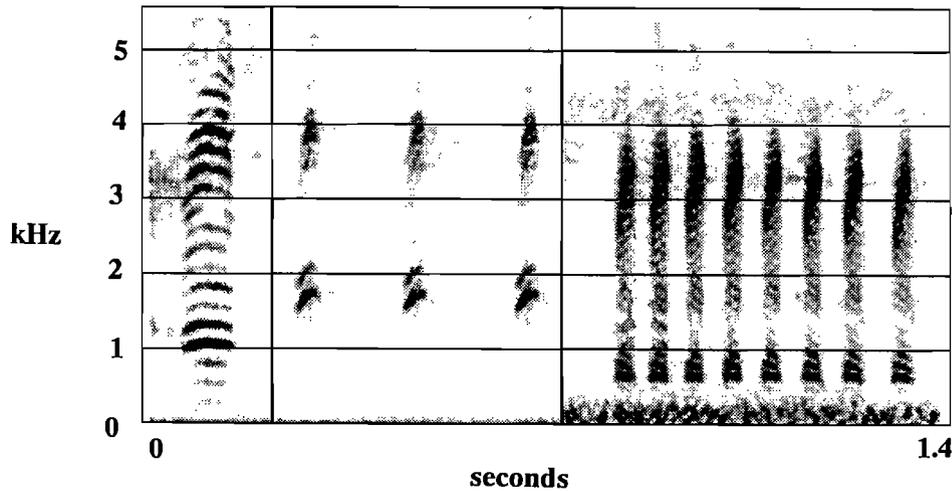
All recordings were made in the field using a Sony TCD 5M recorder and a directional microphone. Air temperatures were between 23°C and 25°C. Males call from concealed positions under vegetation, while sitting in shallow water. Males were heard calling in groups and singly. The call consists of a short whistle, with a duration of 50 ms, produced at a rate of six calls per second. Each note rises in pitch with the emphasized frequency at 1,6 kHz, and harmonics at 2,0 and 3,8 kHz (Figure 4). The analysis was carried out with the program SOUNDEDIT (Farallon). The calls of two other species, *P. mossambica* and *P. schillukorum*, with which *P. mapacha* might be confused morphologically, are also illustrated. There is as yet no evidence that *P. schillukorum* and *P. mapacha* are sympatric.

#### Eggs and tadpoles

These are presently unknown. The eggs of other species of *Ptychadena* in the area are deposited in small muddy pools, where they float on the surface. The known tadpoles of this genus are all very similar (Power 1927; Guibé & Lamotte 1958; Lamotte & Perret 1961; Laurent 1964; Van Dijk 1966; Stevens 1972) and it is expected that the eggs and tadpoles will resemble other *Ptychadena* species.

#### Distribution

Presently *P. mapacha* is only known from Katima Mulilo



**Figure 4** The advertisement calls of *Ptychadena mossambica* CAS 160419 (left-most), *Ptychadena mapacha* SMR 26145 (middle three), and *Ptychadena schillukorum* CAS 182008 (right-most eight). The calls of *P. mossambica* and *P. mapacha* were recorded at Katima Mulilo in Namibia, and the call of *P. schillukorum* was recorded at Beira in Mozambique. *P. schillukorum* is not known to be sympatric with *P. mapacha*.

**Table 2** Advertisement call parameters from known sonograms of *Ptychadena schillukorum*, including *P. floweri*, now included in its synonymy

	Locality and Source				
	Ghana Schiotz (1964)	Tanzania V.d. Elzen & Kreulen (1979)	Cameroon Amiet (1974)	Malawi Stevens (1974)	Mozambique Field record
Note duration (ms)	20	25	20	–	32
Number of notes	5–6	7	6	–	8
Low emphasized frequency (Hz)	500	900	1000	–	650
High emphasized frequency (kHz)	3,5	2,6	2,6	–	3,3
Notes/s	17	13	17	–	14
Call position	close to puddle	–	floating	floating	floating
Description	'dry rattle'	'dry rattle or machine gun'	–	'machine gun'	'machine gun'

and surrounding areas in Namibia. Other specimens belonging to this new species may be found in collections presently identified as *P. schillukorum* (*P. cotti* or *P. floweri*). Extensive fieldwork is required, as the distinct advertisement call would be the first clue to the presence of this species.

#### The status of *Ptychadena floweri*

The taxonomy of some grass frogs, previously confused as *Ptychadena cotti*, *P. schillukorum* or *P. floweri* was reviewed by Perret (1987). He showed that the three names were probably synonymous, with the senior synonym, *P.*

*schillukorum*, being applied to the form known from Mozambique northwards to Somalia. Perret tentatively retained the name *P. floweri* for the form reaching west Africa. The published descriptions of calls from Ghana to Malawi are similar (Perret 1987). Examination of all the published sonograms of *P. floweri* and *P. schillukorum* (Schiotz 1964; Amiet 1974; Van den Elzen & Kreulen 1979), plus analysis of *P. schillukorum* calls recorded in Mozambique, shows that only one species is present as all the call parameters are similar (Table 2). Voucher specimens are available for all recordings. In view of this, the frog from west Africa previously known as *Ptychadena floweri* should be synonymized with *P. schillukorum*. Unlike most other grass frogs, *P. schillukorum* calls while floating.

#### Material examined

*Ptychadena floweri*: CAS 148163, 148167, 148194, 148195, 148299, 152863.

*Ptychadena mossambica*: CAS 160419, 160420, 160426, 160431, 160450, 160466.

*Ptychadena schillukorum*: CAS 182008

#### Acknowledgements

The Ministry of Wildlife, Conservation and Tourism of Namibia provided collecting permits, and the University of the Western Cape assisted financially. Mike Griffin is thanked for his support of this research in Namibia. Specimens were kindly loaned by Ilke von Holtz (State Museum, Windhoek) and Jens Vindum and Bob Drewes (CAS), who also measured CAS 160547.

#### References

- AMIET J.-L. 1974. Voix d'Amphibiens camerounais IV. — Raninae: genres *Ptychadena*, *Hildebrandtia* et *Dicroglossus*. *Ann. Fac. Sci. Univ. féd. Cameroun* 18: 109–128.
- CHANNING, A. 1989. New frog records from the Eastern Caprivi Strip, South West Africa/Namibia. *Madoqua* 16: 1–4.

- GUIBÉ, J. & LAMOTTE, M. 1958. La réserve naturelle intégrale du Mont Nimba. Fasc. IV. XII Batraciens (sauf *Arthroleptis*, *Phrynobatrachus* et *Hyperolius*). *Mem. Inst. franç. Afr. noire*. 53: 241–273, pls. I–XI.
- LAMOTTE, M. & PERRET, J.-L. 1961. Contribution à l'étude des batraciens de l'Ouest africain. XI — Les formes larvaires de trois espèces de *Ptychadena*: *Pt. macCarthyensis* And., *Pt. perreti* G. et L. et *Pt. mascareniensis* D. et B. *Bull. Inst. franç. Afr. noire* 23A: 192–210.
- LAURENT, R.F. 1964. Reptiles et Amphibiens de l'Angola (Troisième contribution). *Publ. Cult. Comp. diam. Angola* 67: 11–165.
- PASSMORE, N.I. 1977. Mating calls and other vocalizations of five species of *Ptychadena* (Anura: Ranidae). *S. Afr. J. Sci.* 73: 212–214.
- PERRET, J.-L. 1987. A propos de *Ptychadena schillukorum* (Werner, 1907)(Anura, Ranidae). *Bull. Soc. neuchât. Sci. nat.* 110: 63–70.
- POWER, J.H. 1927. Notes on the habits and life-histories of South African Anura, with descriptions of the tadpoles. *Trans. Roy. Soc. S. Afr.* 14: 237–247.
- POYNTON, J.C. & BROADLEY, D.G. 1991. Amphibia Zambesiaca 5. Zoogeography. *Ann. Natal Mus.* 32: 221–277.
- SCHIØTZ, A. 1964. The voices of some west African amphibians. *Vid. Medd. Dansk. naturh. Foren.* 127: 35–83.
- STEVENS, R.A. 1972. A new species of *Ptychadena* (Amphibia: Ranidae) from southern Malawi. *Arnoldia (Rhod.)* 5: 1–14.
- VAN DEN ELZEN, P. & KREULEN, D.A. 1979. Notes on the vocalizations of some amphibians from the Serengeti National Park, Tanzania. *Bonn zool. Beir.* 30: 385–403.
- VAN DIJK, D.E. 1966. Systematic and field keys to the families, genera and described species of southern African tadpoles. *Ann. Natal Mus.* 18: 231–286.