

# On the identities of two enigmatic reed frog taxa from South Sudan, *Rappia papyri* WERNER, 1908 and *Rappia pachyderma* WERNER, 1908 (Anura: Hyperoliidae)

Über die Identitäten zweier rätselhafter Riedfroschtaxa aus dem Südsudan, *Rappia papyri* WERNER, 1908 und *Rappia pachyderma* WERNER, 1908  
(Anura: Hyperoliidae)

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## KURZFASSUNG

Die Identitäten zweier Riedfroschtaxa werden Neubewertet. Es wird gezeigt, daß *Rappia papyri* WERNER, 1908 eine eigenständige und valide Art in der *H. nasutus*-Gruppe der Gattung *Hyperolius* ist. *Rappia pachyderma* WERNER, 1908 wird aus der Synonymie mit *Hyperolius viridiflavus* (DUMÉRIL & BIBRON, 1841) herausgenommen und in die Synonymie von *H. papyri* gestellt.

## ABSTRACT

The identities of two reed frog taxa are re-assessed. *Rappia papyri* WERNER, 1908 is shown to represent a distinct and valid species in the *H. nasutus* group of the genus *Hyperolius*. *Rappia pachyderma* WERNER, 1908 is removed from the synonymy of *Hyperolius viridiflavus* (DUMÉRIL & BIBRON, 1841) and referred to the synonymy of *H. papyri*.

## KEY WORDS

Amphibia: Anura: Hyperoliidae; *Rappia papyri*, *Rappia pachyderma*, *Hyperolius nasutus*, *Hyperolius viridiflavus*, synonymy, systematics, taxonomy, Anglo-Egyptian Sudan, South Sudan, Uganda, Ethiopia

## INTRODUCTION

In 1905, Franz WERNER conducted a zoological expedition to the Anglo-Egyptian Sudan ("Ägyptischen Sudan") and the north of the British Protectorate of Uganda ("Nord-Uganda"). He collected mostly between Khor Attar (09° 20' 11" N, 031° 25' 08" E) and Gondokoro (04° 54' 09" N, 031° 39' 46" E) along the White Nile, a region which nowadays lies within the political boundaries of South Sudan. The results of the expedition were published in a series of papers, including one about the amphibians and reptiles (WERNER 1908). WERNER (1908) assigned the frogs he had collected to 22 species, of which he regarded six as new; among them three of the genus *Rappia* GÜNTHER, 1865 (= *Hyperolius* RAPP, 1842): *Rappia papyri* WERNER, 1908, *Rappia pachyderma* WERNER, 1908, and *Rappia balfouri* WERNER, 1908. WERNER stated that he

had "not been able to find among the more than fifty described species of this large and difficult genus the three Sudanese representatives" and he had "to assume that they were still unknown". However, currently only one of the three species is considered valid (*H. balfouri*), whereas *H. pachydermus* is considered a junior synonym of *H. viridiflavus* (DUMÉRIL & BIBRON, 1841) (LAURENT 1951) and *H. papyri*, which for a long time had been regarded a junior synonym of *H. nasutus* GÜNTHER, 1865 (NOBLE 1924), is placed "*incertae sedis*" in the genus *Hyperolius* (CHANNING et al. 2002, 2013; FROST 2014).

In the course of a study of the taxonomy and systematics of East and Central African *Hyperolius*, the author of the present paper examined WERNER's material deposited in the collection of the Naturhistori-

sches Museum Wien, Austria (NHMW). The examination of the *Hyperolius* types revealed that *H. papyri* should be regarded a valid species within the *H. nasutus* group and that

the current taxonomic status of *H. pachydermus* as a junior synonym of *H. viridiflavus* is unwarranted; instead, it is herein referred to the synonymy of *H. papyri*.

## MATERIALS AND METHODS

Specimens are deposited in the herpetological collection of the NHMW. Locality and collecting data are presented in the taxonomic account.

The following measurements were taken with a digital calliper (to the nearest 0.1 mm) under a dissecting microscope, mostly following DEHLING (2012): Snout-vent length (SVL, from tip of snout to vent); tibiofibula length (TFL, measured by both knee and tibio-tarsal articulation flexed); thigh length (THL, from vent to knee with thigh being held laterally at right angle to the body and knee flexed); foot length (FOT, from proximal end of inner metatarsal tubercle to tip of fourth toe); head width (HW, measured at corners of the mouth); head length (HL, from posterior end of mandible to tip of snout); horizontal eye diameter (ED); eye-to-nostril distance (EN, from anterior edge of orbit to centre of nostril); nostril-snout distance (NS, from centre of nostril to tip of snout); internarial distance (NN, distance between centres of nostrils); snout length (SL, from anterior edge of orbit to tip of snout); interorbital distance (IO, shortest distance between upper eyelids); upper eyelid width (EW, maximal width of upper eyelid). To describe the extent of the webbing between fingers and toes, formulae are given as follows: Digits are indicated by bold Roman numerals (**I-IV** [fingers] and **I-V** [toes], starting from the pollex and the hallux, respectively). The digits are separated by slashes (“/”). The number of phalanges free

of web on the preaxial side is given left of the numeral, that on the postaxial side right of the numeral, except for the first and last digits for which only the number of free phalanges on the postaxial and the preaxial side, respectively, is given. If the webbing extends to the proximal or distal edge of a subarticular tubercle, this is indicated by adding a plus (“+”) or a minus sign (“-”), respectively, to the number of free phalanges. If the number of free phalanges varies between individuals, the different states are listed, from the smallest to the largest number, separated by commas (“,”); and the percentage X, rounded to a natural number, of individuals in which the particular state was observed is given in subscripted square brackets (“[X]”). The webbing of the holotype of *H. papyri* is also illustrated using a diagram, following CHANNING et al. (2013). Sex was determined by examination of the vocal sac and throat region and comparing them to states observed in series of subadult and adult males of other species of *Hyperolius* (*Hyperolius rwandae* DEHLING, SINSCH, RÖDEL & CHANNING in CHANNING, HILLERS, LÖTTERS, RÖDEL, SCHICK, CONRADIE, RÖDDER, MERCURIO, WAGNER, DEHLING, DU PREEZ, KIELGAST & BURGER, 2013, *H. viridiflavus*, and *H. castaneus* AHL, 1931; specimens from the author’s working collection, University of Koblenz). Because of the brittleness of the specimens, the author refrained from an examination of the gonads.

## RESULTS

The examined material of *Hyperolius papyri* consists of the holotype (NHMW 14847, Figs. 1A, 1B, 1D), specimen NHMW 33144 (Fig. 1C), erroneously referred to as paratype of *Rappia papyri* WERNER, 1908,

in HÄUPL et al. (1994) [GRILLITSCH in litt. 2015.06.26] and a third individual (NHMW 3704) collected by WERNER (1919) during his second Sudan expedition to Kurdufan (“Kordofan”). The three specimens are very



Fig. 1: A - Dorsal view of the holotype of *Hyperolius papyri* (WERNER, 1908) (NHMW 14847),  
 B - lateral view of the holotype of *H. papyri*,  
 C - dorsolateral view of the specimen erroneously referred to as paratype of *H. papyri* (NHMW 33144),  
 D - ventral view of the holotype of *H. papyri*,  
 E - holotype of *Hyperolius pachydermus* (WERNER, 1908) (left, NHMW 22900, subadult male, SVL 16.3 mm) and  
 syntype of *Hyperolius viridiflavus* (DUMÉRIL & BIBRON, 1841) (right, NHMW 22896, female, SVL 30.3 mm),  
 F - dorsolateral view of the holotype of *H. pachydermus*,  
 G - ventral view of the holotype of *H. pachydermus*,  
 H - head profile of the holotype of *H. pachydermus*.

Abb. 1: A - Dorsalansicht des Holotypus von *Hyperolius papyri* (WERNER, 1908) (NHMW 14847),  
 B - Lateralansicht des Holotypus von *H. papyri*, C - Dorsolateralansicht des irrtümlich als Paratypus von  
*H. papyri* bezeichneten Exemplars (NHMW 33144), D - Ventralansicht des Holotypus von *H. papyri*,  
 E - Holotypus von *Hyperolius pachydermus* (WERNER, 1908) (links, NHMW 22900, subadultes Männchen,  
 KRL 16,3 mm) und Syntypus von *Hyperolius viridiflavus* (DUMÉRIL & BIBRON, 1841)  
 (rechts, NHMW 22896, Weibchen, KRL 30,3 mm),  
 F - Dorsolateralansicht des Holotypus von *H. pachydermus*,  
 G - Ventralansicht des Holotypus von *H. pachydermus*, H - Profilansicht des Kopfes von *H. pachydermus*.

similar in their external morphology and there is no doubt that they belong to the same species. The combination of several diagnostic characters (see below) places them in the *H. nasutus* group of the genus *Hyperolius* and distinguishes them from all other species in the group, as recently defined by CHANNING et al. (2013). Therefore, *H. papyri* is regarded here as a distinct, valid species. The species is re-described below.

*Hyperolius pachydermus* had been described by WERNER based on a single specimen from Gondokoro (holotype, NHMW 22900, see also HÄUPL et al. 1994; Figs. 1E, 1F, 1G, 1H). WERNER (1908) stated that it was female, but it is a subadult male with a still developing gular disc and vocal sac (Fig. 1G). WERNER (1908) considered *H. pachydermus* different from *H. papyri* based on its supposedly shorter and more truncate snout, more extensive foot webbing, thick skin, and the “chalk-white” (“kreideweiß”) coloration. The examination of the holotype showed that its snout is a little damaged and slightly compressed, explaining the observed differences in shape. Still, the sharp snout of *H. pachydermus* is pointed in dorsal view and shark-like in profile like the snout of *H. papyri* (Figs. 1B, 1H). Contrary to WERNER’s original description stating that the foot webbing differed between the two species (“two-third webbed” vs. “three-fourth webbed”), the only difference is that the webbing of the holotype of *H. pachydermus* extends slightly beyond the distal subarticular tubercle on the fifth toe (1.75V) whereas in the holotype of *H. papyri* it reaches only the distal edge of the distal tubercle (2-V); otherwise, the extent of the foot and hand webbing does not differ between the specimens. The thick, chalk-white skin is explainable by the circumstances in which the specimen was collected, i.e., on an exceptionally hot day at noon, perching in bright sunlight at a temperature of more than 40 °C (in the shade) (WERNER 1908). Several savanna species of reed frogs increase the number of purine (guanine and hypoxanthine)-crystal-containing iridophores in the skin which play an important role in temperature regulation and probably also osmoregulation in dry conditions (e.g., KOBELT & LINSSENMAIR 1986; SCHMUCK & LINSSENMAIR

1988). The skin thickens and the increased amount of iridophores causes a light skin coloration up to “a brilliant white” at air temperatures above 37 °C (KOBELT & LINSSENMAIR 1986) which is the most likely explanation for the skin color of the holotype of *H. pachydermus*. Although the dorsal skin of the specimen is generally light, two silvery-white dorsolateral bands are traceable which run from the snout along the upper eyelids to the groin and are common in species of the *H. nasutus* group (CHANNING et al. 2013), including the NHMW specimens of *H. papyri*. The body except the largely unpigmented parts on the thigh and the vocal sac is speckled with minute rounded dots which is also the case in the specimens of *H. papyri*. The size (SVL 16.3 mm) is somewhat larger than that of the vouchers of *H. papyri* (holotype: 13.6 mm; second Gondokoro specimen: 14.1 mm; Renk specimen: 15.5 mm). However, the Gondokoro individuals of *H. papyri* are subadult males which show an initial formation of the vocal sac whereas the vocal sacs are further developed in the Renk specimen and the holotype of *H. pachydermus*, indicating a higher age which accounts for the size differences. The legs of the holotype of *H. pachydermus* are moderately long, with the tibio-tarsal articulation reaching the anterior margin of the eye which matches the state observed in the specimens of *H. papyri*.

*Hyperolius pachydermus* is currently considered a synonym of *H. viridiflavus*. The author compared the holotype of *H. pachydermus* to a syntype of *H. viridiflavus* (NHMW 22896, female from “Abyssinien” [= Ethiopia]; Fig. 1E) and a large series of *H. viridiflavus* from Rwanda (JMD working collection, University of Koblenz). The two species are easily distinguished by snout shape (long, sharp, pointed in dorsal view, and acute in profile in *H. pachydermus* vs. short, rounded in dorsal view, and truncate in profile in *H. viridiflavus*; Fig. 1E), size (16.3 mm in subadult male vs. > 25 mm in adult males; 30.3 mm in syntype, Fig. 1E), visibility of tympanum (invisible vs. discernible), dorsal pattern (silvery-white dorsolateral bands present, speckled with minute dots vs. bands absent, not speckled) and extent of pedal webbing (I2-/2+III1.5/2.5III1.5/3-IV2/1.75V vs. I1.5<sub>[60]</sub>1.75<sub>[20]</sub>,



$2_{-20}/2_{[30]}, 2_{+70}/\text{III}1_{+50}/1.25_{[50]}/2_{[40]}, 2_{+60}/\text{III}1_{+2+IV}2/1+V$  in males from Rwanda ( $n = 10$ ),  $12-2/\text{III}1+2/\text{III}1+2+IV2/1+V$  in the syntype). The synonymy of *H. pachydermus* and *H. viridiflavus* is therefore

unwarranted. Instead, for matching closely the diagnostic characters of *H. papyri* and considering the sympatric occurrence of the two forms, *H. pachydermus* is herewith referred to the synonymy of *H. papyri*.

#### Taxonomic account

##### *Hyperolius papyri* (WERNER, 1908)

**Synonyms.** - *Rappia papyri*: WERNER (1908); *Rappia pachyderma*: WERNER (1908) – new synonymy; *Hyperolius nasutus*: NOBLE (1924; partim); *Hyperolius pachydermus*: NOBLE (1924) – new synonymy; *Hyperolius papyri*: AHL (1931); *Hyperolius pachyderma*: AHL (1931) – new synonymy; *Hyperolius viridiflavus pachydermus*: LAURENT (1951; partim) – new synonymy; *Hyperolius viridiflavus* (nec DUMÉNIL & BIBRON): SCHIÖTZ (1971; partim) – new synonymy.

**Holotype.** - NHMW 14847, subadult male, collected by Franz WERNER in “Gondokoro, Uganda” (= Gondokoro, South Sudan;  $04^{\circ} 54' 09''$  N,  $031^{\circ} 39' 46''$  E) in March 1905.

**Referred specimens.** - NHMW 3704, subadult male, collected by Franz WERNER in “Renk am Weißen Nil, Anglo-ägyptischer Sudan” (= Renk, South Sudan;  $11^{\circ} 44' 35''$  N,  $032^{\circ} 48' 18''$  E), 20 April 1914; NHMW 22900, subadult male, collected by Franz WERNER in “Gondokoro, Uganda” (= Gondokoro, South Sudan;  $04^{\circ} 54' 09''$  N,  $031^{\circ} 39' 46''$  E) in 1905 [holotype of *Rappia pachyderma* WERNER, 1908]; NHMW 33144 (erroneously referred to as paratype of *Rappia papyri* WERNER, 1908, in HÄUPL et al. (1994) [GRILLITSCH in litt. 2015.06.26]), subadult male, same collection details as holotype NHMW 14847.

**Diagnosis.** - The horizontal pupil, elongated body, comparatively small and long head, sharp snout, invisible tympanum, light green dorsal live coloration with dorsolateral silvery-white band put the species in the *H. nasutus* group of the genus *Hyperolius* (SCHIÖTZ 1999; AMIET 2005).

The snout of *H. papyri* is shark-like in profile, protruding forward of the mouth in a straight line, before forming a sharp tip. It differs from the truncated, sharply or blunt-

ly rounded snout profiles as in *Hyperolius acuticeps* AHL, 1931; *H. adspersus* PETERS, 1877; *H. dartevellei* LAURENT, 1943; *H. friedemanni* MERCURIO & RÖDEL in CHANNING, HILLERS, LÖTTERS, RÖDEL, SCHICK, CONRADIE, RÖDDER, MERCURIO, WAGNER, DEHLING, DU PREEZ, KIELGAST & BURGER, 2013; *H. igbettensis* SCHIÖTZ, 1963; *H. jacobseni* CHANNING in CHANNING, HILLERS, LÖTTERS, RÖDEL, SCHICK, CONRADIE, RÖDDER, MERCURIO, WAGNER, DEHLING, DU PREEZ, KIELGAST & BURGER, 2013; *H. lupiroensis* CHANNING in CHANNING, HILLERS, LÖTTERS, RÖDEL, SCHICK, CONRADIE, RÖDDER, MERCURIO, WAGNER, DEHLING, DU PREEZ, KIELGAST & BURGER, 2013; *H. nasutus*; *H. poweri* LOVERIDGE, 1938; *H. rwandae*; and *H. viridis* SCHIÖTZ, 1975. The legs are comparatively short, the tibio-tarsal articulation reaching to the anterior margin of the eye. Thereby, the species can be distinguished from those species in which the tibio-tarsal articulation reaches almost to, all the way to, or beyond the level of the tip of the snout, i.e., *H. acuticeps*; *H. benguelensis* (BOCAGE, 1893); *H. dartevellei*; *H. howelli* DU PREEZ & CHANNING in CHANNING, HILLERS, LÖTTERS, RÖDEL, SCHICK, CONRADIE, RÖDDER, MERCURIO, WAGNER, DEHLING, DU PREEZ, KIELGAST & BURGER, 2013; *H. igbettensis*; *H. jacobseni*; *H. lupiroensis*; *H. nasutus*; *H. poweri*; *H. rwandae*; and *H. viridis*. The webbing extends to the median subarticular tubercle on the preaxial side of the fourth toe and does not reach the disk of the fifth toe; this distinguishes *H. papyri* from those species, in which the webbing extends beyond this tubercle on the fourth toe and/or reaches the disk of the fifth toe, i.e., *H. acuticeps*; *H. adspersus*; *H. benguelensis*; *H. dartevellei*; *H. friedemanni*; *H. igbettensis*; *H. jacobseni*; *H. lupiroensis*; *H. rwandae*; and *H. viridis*. The webbing

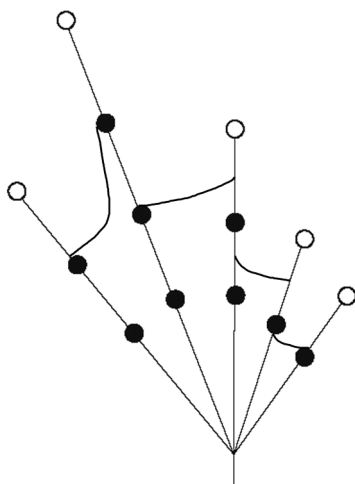


Fig. 2: Diagram showing the extent of pedal webbing in the holotype of *Hyperolius papyri* (WERNER, 1908) (NHMW 14847).

Abb. 2: Diagramm zur Veranschaulichung der Ausdehnung der Spannhäute des Fußes beim Holotypus von *Hyperolius papyri* (WERNER, 1908) (NHMW 14847).

extends to between the distal subarticular tubercle and the disk on the postaxial side of the third toe, which distinguishes *H. papyri* from those species, in which the webbing does not extend beyond the distal subarticular tubercle of the third toe, i.e., *H. howelli*; *H. igbettensis*; *H. inyangae* CHANNING in CHANNING, HILLERS, LÖTTERS, RÖDEL, SCHICK, CONRADIE, RÖDDER, MERCURIO, WAGNER, DEHLING, DU PREEZ, KIELGAST & BURGER, 2013; *H. nasicus* LAURENT, 1943; *H. poweri*; and *H. viridis*.

**Description of the holotype.**—Body long and slender, widest at temporal region, slightly tapering to groin; head comparatively small (HL/SVL 0.34, HW/SVL 0.29), wider than trunk, longer than wide (HL/HW 1.18); snout long (SL/HL 0.47), pointed in dorsal view, acute in profile, considerably projecting beyond lower jaw (Figs. 1B, 1D); canthus rostralis distinct, moderately sharp, slightly concave from eye to nostril, almost straight-lined from nostril to tip of snout in dorsal view; loreal region almost

vertical, slightly concave; nostril directed anterolaterally, oval; situated closer to tip of snout than to eye (EN/NS 1.21), separated from each other by distance greater than distance between eye and nostril (NN/EN 1.16); eyes directed anterolaterally, moderately protruding, relatively small (ED/HL 0.31); eye diameter much shorter than snout (ED/SL 0.67); interorbital space almost twice as wide as upper eyelid (IO/EW 1.94), and almost equalling internarial distance (IO/NN 1.04); tympanum not visible externally; upper jaw with dentition; teeth on premaxilla larger than those on maxilla; choanae small, oval, located far anterolaterally at margins of roof of the mouth, concealed by palatine ridge along maxilla in ventral view; vomer processes and teeth absent; tongue long and narrow, free for about three-fourths of length, bifurcated distally for about one-fourth of length; vocal sac single, median, subgular, not fully developed.

Dorsal surface of head, trunk and limbs smooth; ventral surface of limbs and chin smooth; chest and abdomen slightly more areolate; supratympanic fold absent. Vocal sac not fully developed, partly covered by dermal flap at throat.

Forelimbs slender; hand moderately large; tips of fingers enlarged into broad oval disks, each with circummarginal groove; relative length of fingers: I<II<IV<III; subarticular tubercles rounded, well developed, numbering one on Fingers I and II, two on Fingers III and IV; webbing formula of the hand  $I2+/2+II2+/3III2+/2IV$ ; thenar tubercle oval, very small, low; palmar tubercles indiscernible; metacarpus without supernumerary tubercles; nuptial pads or asperities absent.

Hindlimbs slender, moderately long; tibio-tarsal articulation reaching to level of anterior margin of eye when legs are adpressed to body; tibiofibula moderately long (TFL/SVL 0.50), longer than thigh (TFL/THL 1.11); heels overlapping each other slightly when knees are flexed and thighs are held perpendicularly to median body plane; foot shorter than tibiofibula (FOT/TFL 0.79); relative length of toes: I<II<III<V<IV; discs of toes smaller than those of fingers; subarticular tubercles well developed, numbering one on Toes I and II,

two on Toes III and V, and three on Toe IV; pedal webbing formula  $\text{I2-}/2+\text{III1.5}/2.5\text{III1.5}/3\text{-IV2}/2\text{-V}$  (Fig. 2); inner metatarsal tubercle small (less than half length of metatarsus), oval, prominent; outer one indistinct.

**Coloration in life.**—According to WERNER (1908), brownish green dorsally with white dorsolateral bands purled with rows of brown dots; fine middorsal longitudinal line formed by dots from tip of snout to vent; small brown dots speckled on head, back and limbs.

**Variation.**—The three other specimens agree largely in body proportions. TFL/SVL ratio is 0.47–0.51, TFL/THL 1.04–1.16, HW/SVL 0.28–0.34, HW/HL 1.10–

1.18. Pedal webbing variation is  $\text{I2-}/2+\text{II1.5}/2.5\text{III1.5}/3\text{-IV2}/1.75_{[33]}, 2_{-[67]}\text{V}$ .

**Distribution.**—NHMW 14847, 33144, and 22900 were collected at Gondokoro ( $04^{\circ} 54' 09''$  N,  $031^{\circ} 39' 46''$  E). WERNER (1908) also reported the species from Khor Attar ( $09^{\circ} 20' 11''$  N,  $031^{\circ} 25' 08''$  E) and Mongalla ( $05^{\circ} 11' 58''$  N,  $031^{\circ} 46' 08''$  E). An additional specimen (NHMW 3704) was collected at Renk ( $11^{\circ} 44' 35''$  N,  $032^{\circ} 48' 18''$  E). All locations are situated along the White Nile in South Sudan. It is possible that the Ethiopian populations referred to as “*Hyperolius nasutus*”, which appear to have a similar dorsal coloration and pattern, snout shape, and foot webbing (LARGEN 1998), belong to *H. papyri*.

### Taxonomic implications

*Hyperolius pachydermus* was referred to the synonymy of *H. viridiflavus* by LAURENT (1951) who had not examined the holotype of that taxon but merely stated that “the description of *Rappia pachyderma* matches obviously a juvenile of *H. marmoratus* or *H. viridiflavus*”. Based on geography he considered it a subspecies of *H. viridiflavus* and referred *Hyperolius burgeoni* (DE WITTE, 1921), *Hyperolius rossii* (CALABRESI, 1925), and the specimens ANGEL (1925) had assigned to *H. guttulatus* GÜNTHER, 1858, which were all collected in roughly the same region (northeastern Democratic Republic of the Congo [DRC] to western Kenya), to its synonymy. As LAURENT (1951) was not aware of the true identity of *H. pachydermus*, he clearly intended to refer *H. burgeoni*, *H. rossii*, and ANGEL’s *H. guttulatus* to the synonymy of *H. viridiflavus*. These taxa should therefore continue to be regarded as synonyms of *H. viridiflavus*, not *H. papyri*, although *H. pachydermus* is herein referred to the synonymy of the latter.

In another paper, LAURENT (1952) referred *Hyperolius oculatus* AHL, 1931 (type locality: Balaibo, Duki River, northeastern DRC) to the synonymy of *H. viridiflavus pachydermus*, probably based on geography; stating later, after he had examined the type material of *H. oculatus* in

Berlin, that “cette synonymie déjà établie par LOVERIDGE en 1936 est continuée” (LAURENT 1961). LOVERIDGE (1936), however, had not discussed *H. pachydermus* but had referred *H. oculatus* and *Hyperolius phrynoderma* AHL, 1931 to the synonymy of *H. rossii*. LAURENT obviously had confused *H. phrynoderma* with *H. pachydermus* (thereby citing the name wrongly as *H. v. pachyderma*) and mistakenly referred *H. oculatus* to the synonymy of the latter. *Hyperolius oculatus* should continue to be treated as a synonym of *H. viridiflavus*.

Until recently, the name *pachydermus* has been used to designate a subspecies or a variety of *H. viridiflavus* from northern DRC and South Sudan with brown dorsum with small rounded yellow spots and red ventral spots (INGER 1968; SCHIÖTZ 1971, 1975). Based on this description, also specimens from western Ethiopia were assigned to the variety “*pachydermus*” or “*PAC*” (LARGEN 1998; SCHIÖTZ 1999; LARGEN & SPAWLS 2010). As *H. pachydermus* is a synonym of *H. papyri*, the name is no longer applicable to populations of *H. viridiflavus*. Until it is demonstrated that the populations from northeastern DRC, South Sudan, and southwestern Ethiopia differ from *H. viridiflavus* (type locality: Adoua, northern Ethiopia,  $14^{\circ} 10' \text{ N}$ ,  $038^{\circ} 54' \text{ E}$ , LARGEN 2001) they should be referred to by this name.

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