

# The Amphibians of Kiang West National Park, The Gambia

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**Abstract.** In the course of herpetological research in The Gambia, only a few surveys have been undertaken in the eastern part of the country. During the present survey, I recorded 14 amphibian species, eight of which had not been documented in the Kiang West National Park before. New distributional records of *Afrixalus vittiger* and *A. weidholzi* were recorded in The Gambia. These data bring the total number of amphibians known in The Gambia up to 34. Because only three areas were surveyed, which differ in vegetation, water conditions and anthropogenic influence, more species may be expected to occur.

**Key words.** The Gambia; Kiang West National Park; *Afrixalus vittiger*, *A. weidholzi*; new distributional records.

## Introduction

The Gambia has received little attention in the history of herpetological survey of West Africa, which began during the late nineteenth century (e.g. PETERS 1875, 1876, 1877). ANDERSSON (1937) was the first to undertake expeditions in this area; he focused mainly on the lower river bank and the Abuko Nature Reserve of today in the west of the country. Only the investigations by ANDERSSON (1937), GRUSCHWITZ et al. (1991a, b) and MOISER et al. (1997) covered the eastern part of The Gambia. All protected areas of The Gambia were surveyed in June 2002 by L. BARNETT and C. EMMS (in lit.). As a result of this investigation, the total number of known amphibian species in The Gambia comprises 32 species of frogs and toads.

The present survey in the Kiang West National Park contributes to the knowledge of the amphibian fauna of The Gambia and adds two new country records.

## Methods

### Study site

The Gambia is located on the Atlantic coastline of West Africa, bordered by Senegal in

the north, east and south. The whole country covers an area of not more than 11,300 km<sup>2</sup> and is bisected into northern and southern region by the river Gambia. Located in a tropical climate zone, The Gambia experiences a rainy season from June to October and a dry season stretching from November to May. Average temperature during the dry season is 24 °C and during the rainy season in Banjul, The Gambia's capital, 30 °C. The mean annual temperature is 27.4 °C. Altitudinal range is from sea level to about 53 m above sea level. The mean annual precipitation is 1295 mm. Precipitation varies from 0 mm in the dry season to up to 500 mm in August. More humid Guinea savannah on the coast is changing into drier Sudan savannah. The original forests, which are comprised of swamp forest and remnant gallery forest, can be found very sporadically along the creeks. In the north-eastern part of the country, desertification is increasing and thus creating new, comparatively drier habitats in this area.

The Kiang West National Park (KWNP) is located at the lower river division in the Kiang West district, about 145 km from the Atlantic Ocean (Fig. 1). Covering an area of 11,500 ha, KWNP is the second largest National Park in The Gambia and is considered



Fig. 1. The geographical position of Kiang West National Park in Gambia (above) and positions of drift fences 1-3 within the park. Scale bars: 50 km (above) and 2 km. Legend: ★ Banjul; ● Soma; ○ Dumbuto; ● Headquarters of park.

a very important reserve for wildlife. Dry deciduous woodlands form the Guinea savannah, the main habitat type of the park. However, extensive stretches of mangrove creeks and tidal flats can be found along the river Gambia. Even during the dry season, seawater flows back inland at least 150 km. Due to insufficient infrastructure only the south eastern part of the park was surveyed. This area was dominated by Guinea savannah, mangrove creeks, and anthropogenically influenced vegetation such as rice fields.

#### Sampling methods and sampling effort

From 15 August to 15 September 2003, I installed three drift fences in the south-eastern part of KWNP. Drift fences were made out of local materials: common rice bags cut into half and sewn together were used for the barriers, cooking oil barrels with their tops removed served as pitfalls. The fences each had a length of 20 m, with a pitfall every 3 m. The surveyed areas are described below.

Each fence was controlled on a daily basis. In addition to the use of drift fences, surveys were undertaken at day and night when specimens could be located opportunistically. I subjectively compared the calls of different caught individuals of various species with calls that could be heard during the night to obtain an idea of the species' distributions. Specimens caught were photographed and notes of important characteristics were taken. To identify specimens, notes and pictures were compared with species descriptions given in RÖDEL (2000) by myself and M. SOLÉ-KIENLE. To confirm identification, photographs taken were later sent to M.-O. RÖDEL.

The first drift fence (Fig. 2) was set near the headquarters of KWNP along a freshwater rivulet that came from rainwater tank overflows. The rivulet and a shallow pond at its end were surrounded by thick Guinea savannah. To facilitate access to the area, approximately 1 m of vegetation was removed on each side of the rivulet.

For the second drift fence (Fig. 3), the location was chosen at a site about 0.5 km away from the headquarters of KWNP towards the village Dumbuto. There, the landscape was dominated by a shallow fresh water lake, which is a permanent stretch of water. High trees, joined to an area of elephant grass, shade its shores. Close to the fence, an open area near the lake was used for rice cultivation. In south-eastern direction, a larger forest reserve is situated, in which *Bombax costatum*, *Ceiba pentandra*, *Khaya senegalensis*, *Gmelina arborea* and other trees can be found. The drift fence was established between two rows of trees and a rice field, so that amphibians migrating from the lake towards the high elephant grass could be trapped.

Following the eastern border of KWNP through Guinea savannah for approximately 3.5 km, one would reach the third drift fence (Fig. 4) at Nganingkoi Bolong Creek. The creek vegetation consists of low grass and mangroves, which indicate salt water in this area. The drift fence was set behind rice

fields, separated from the mangroves by a small footpath. After heavy rainfall, water flowed from the Guinea savannah into the rice fields, passing the fence. Amphibians, moving from the savannah towards the flooded rice fields and the creek area, had to pass the fence.

## Results and discussion

### Species account

#### Bufonidae

##### *Bufo maculatus* HALLOWELL, 1854

An anuran, which has been recorded in The Gambia by BARNETT et al. (2001) and which seems to be common. *Bufo maculatus* was found in all surveyed locations.

##### *Bufo pentoni* ANDERSSON, 1893

This species has been recorded from KWNP by L. BARNETT and C. EMMS (in lit.). It prefers dry Sahel and Sudan savannah. In more humid habitats, it coexists with *B. regularis* (RÖDEL 2000).

##### *Bufo regularis* REUSS, 1833

A toad, which has been reported from KWNP (L. BARNETT and C. EMMS in lit.). According to RÖDEL (2000), it is a common species in the savannah regions in south of the Sahara. It was caught in the first and second drift fence but, like *B. xeros* (see below), never in any of the pitfalls near the mangrove creek.

##### *Bufo xeros* TANDY, TANDY, KEITH & DUFF-MACKAY, 1976

This species has been found in The Gambia (BARNETT et al. 2001), but not yet in KWNP. After heavy rainfall, I found many specimens during night time. These individuals could be located at open places mostly on footpaths or around the freshwater basin near the first fence. *Bufo xeros* is a typical inhabitant of very dry savannah (RÖDEL 2000).



Fig. 2. Drift fence 1 along a fresh water rivulet surrounded by Guinea savannah.



Fig. 3. Drift fence 2 at a shallow lake.



Fig. 4. Drift fence 3 between Guinea savannah and rice fields.

## Ranidae

*Hoplobatrachus occipitalis* (GÜNTHER, 1859)  
The African Tiger Frog has been reported in The Gambia by BARNETT et al. (2001). It was

found in large numbers in the Abuko Nature Reserve (Fig. 5). Along the main road in Soma, a juvenile *H. occipitalis* was found in a brackish rivulet after a few days of dryness.

## *Ptychadena trinodis* (BOETTGER, 1881)

This is the first record of this species for KWNP. It was previously recorded in Abuko Nature Reserve, The Gambia (BARNETT et al. 2001). Two individuals were observed both inside the mangrove creeks and near the third fence during the day. The habitats of *P. trinodis* encompass dry or extremely dry savannah of the Sudan- and Sahel zone (RÖDEL 2000).

## Petropedetidae

### *Phrynobatrachus francisci* BOULENGER, 1912

This anuran is common in The Gambia including KWNP (L. BARNETT and C. EMMS in lit.). Numerous individuals were found in the pitfalls and in the area around the second drift fence.

## Hyperoliidae

### *Afrixalus vittiger* (PETERS, 1876)

This is the first record of this species in The Gambia. I found *A. vittiger* (Fig. 6) sitting in the flooded rice fields near the second drift fence. Most individuals of *A. vittiger* could be seen during nocturnal observations after rainfall when they were calling in large numbers. Some specimens were also heard on relatively dry nights; however, in lower numbers and only in the area described above.

### *Afrixalus weidholzi* (MERTENS, 1937)

This banana frog species is recorded here for the first time from The Gambia. This country lays within the known distribution of *A. weidholzi* (Fig. 7). The species is listed for The Gambia by FROST (2004), but, according to RÖDEL (2000), there is no published record of *A. weidholzi* from this country. Numerous juvenile specimens were found at the second fence. When handling individuals for some time, skin irritations and burning occurred.

*Kassina senegalensis* (DUMÉRIL & BIBRON, 1841)

This anuran was recorded for the first time in KWNP, but it has been previously sighted in The Gambia by BARNETT et al. (2001). I observed exclusively juveniles at the second fence.

*Kassina cassinoides* (BOULENGER, 1903)

According to RÖDEL (2000), *K. cassinoides* is known from The Gambia. This is the first record of this species from KWNP. The whistle-like call could be heard at dusk after every heavy rainfall in two of the surveyed areas: in the Guinea savannah near the first fence and along a small footpath from Dumbuto inside the park. The latter area was close to the shallow lake, surrounded by rice fields.

*Kassina fusca* SCHIÖTZ, 1967

This species was recorded for the first time from KWNP; however, is already known from The Gambia (BARNETT et al. 2001). During this survey, only two specimens were caught in the second drift fence.

*Leptopelis bufonoides* SCHIÖTZ, 1967

This tree frog has been reported from KWNP (L. BARNETT and C. EMMS in lit.). After heavy rainfalls, six individuals were caught in maize, cous-cous and rice fields.

#### Microhylidae

*Phrynomantis microps* PETERS, 1875

The Rubber Frog has been recorded from KWNP by L. BARNETT and C. EMMS (in lit.). Seven individuals were found at the second fence and one in a pitfall belonging to the first fence.

#### Remarks

As shown in Table 1, most individuals were recorded at the second location. This area includes a large freshwater reservoir, where many species reproduce during the rainy season. With proximity to the forest reserve



Fig. 5. *Hoplobatrachus occipitalis* in a rivulet along the main road in Soma.



Fig. 6. *Afrixalus vittiger*.



Fig. 7. Juvenile of *Afrixalus weidholzi*.

at the shore, this location provides a dense tree vegetation which probably represents good conditions for juvenile amphibians.

*Phrynomantis microps* has variable calling sites on its way towards the water (RÖDEL 2000). Its occurrence in the first area could be

Species	number of individuals per location			
	location 1	location 2	location 3	elsewhere
<i>Bufo maculatus</i>	6	6	5	
<i>Bufo pentoni</i>	3	5	3	
<i>Bufo regularis</i>	i*	i		
<i>Bufo xeros</i>	i*	i		
<i>Hoplobatrachus occipitalis</i>				1
<i>Ptychadena trinodis</i>			2	
<i>Phrynobatrachus francisci</i>		6		
<i>Afrixalus vittiger</i>		1*		
<i>Afrixalus weidholzi</i>		i		
<i>Kassina senegalensis</i>		i		
<i>Kassina cassinoides</i>	2+	2+		
<i>Kassina fusca</i>		2		
<i>Leptopelis bufonoides</i>		6		
<i>Phrynomantis microps</i>	1	7		
total number of individuals	> 32	> 75	10	1

Tab. 1. Amphibian species recorded in KWNP by surveyed locations (see text). Legend: i = more than 10 individuals caught, \* = more than 20 individuals observed, + = many individuals heard.

explained by the path taken from the first location to the lake at the second area. All *Bufo* species occurred at the first location. As these species feed on termites, the termite hills close to the area might be one reason for their presence there. The lights of the head-quarter buildings might be another explanation for the individuals found in the area of the drift fence, since insects are attracted by the light.

In the third area, mainly saltwater is present, which is apparently the reason for the small number of individuals found in this part of the park.

In total, I recorded 14 amphibian species from KWNP. *Afrixalus vittiger* and *A. weidholzi* are reported for the first time from The Gambia. In addition, seven species are new records for KWNP and *Hoplobatrachus occipitalis* was recorded in the Kiang West District. New findings bring the number of amphibian species known from The Gambia to 34.

Considering the preferred habitats by all species recorded, it is obvious that KWNP comprises a mixture of species of humid and arid savannah regions. This might either result from a natural combination of humid

Guinea savannah and arid Sudan savannah in KWNP or be due to the ongoing desertification process in the north-eastern part of the country. The latter explanation cannot be proved due to a lack of comparable herpetological data from KWNP in previous years.

Compared with the amphibian species occurring in Senegal, which prefer habitats in the transition zones between Guinea and Sudan savannah, many species have not been sighted in The Gambia to date. The species recorded by JOGER et al. (2002) in a region in the south-eastern Senegal (i. e. ecologically matching The Gambia), are partially known from both countries. Therefore, species with comparable habitat preferences like *Ptychadena floweri* (WERNER, 1908) or *Phrynobatrachus calcaratus* (PETERS, 1863), recorded in south-eastern Senegal, are likely to occur in The Gambia. The occurrence of species in KWNP known from other parts in The Gambia is also probable. JOGER (1981), GRUSCHWITZ et al. (1991a) and BARNETT et al. (2001) already recorded *Hyperolius occidentalis* SCHIØTZ, 1967 and *H. concolor* (HALLOWELL, 1844) in the Abuko Nature Reserve.

During preliminary observations in KWNP by L. BARNETT and C. EMMS (in lit.), one drift fence was installed and six amphibian species were documented. The same location was sampled again in this survey. The fact that 2.3 times more species were recorded in this study by simultaneously surveying three areas that vary in habitat conditions in a very small part of the park also strengthen the assumption that more species may be expected in KWNP.

### Acknowledgements

I would like to thank The Gambia Wildlife Department for making it possible to carry out this survey; especially ALPHA JALLOW for all correspondence before arriving in The Gambia, FAMARA DRAMMEH, who issued the research permission, and LAMIN SANYANG for providing of a lot of useful information about the area. I want to underline the very valuable help of MARK-OLIVER RÖDEL and MIRCO SOLÉ-KIENLE in species determination and for useful comments on the manuscript. I am also especially thankful to UDO GANSLOSSER, who provided invaluable help on the preparations, and LINDA BARNETT and CRAIG EMMS, who were very helpful to me in The Gambia. I would also like to thank BUNJA, JAHMAN TEE, the other workers of KWNP and the people of Dumbuto village for their support.

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Manuscript received: 28 July 2004

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