



Notes on the herpetofauna of Nacebe (Provincia Abuna, Departamento Pando, Bolivia)

Jiří Moravec¹ and James Aparicio²

¹*Department of Zoology, National Museum, 115 79 Praha 1, Czech Republic; jiri.moravec@nm.cz*

²*Coleccion Boliviana de Fauna – Museo Nacional de Historia Natural, Casilla 8706, La Paz, Bolivia*

Received March 3, 2004

Accepted June 15, 2004

Abstract. The paper brings an annotated list summarizing faunistic and natural history data on 28 amphibian and 22 reptile species recorded in the vicinity of the settlement of Nacebe (central part of the Departamento Pando, Amazonian Bolivia). The recorded species diversity is compared with the faunal data available from the surroundings of the town of Riberalta (Departamento Beni, Amazonian Bolivia). The possible effect of the river system of the Rio Madre de Dios and Rio Beni on the distribution of some amphibian taxa is considered.

■ Amphibia, Reptilia, Departamento Pando, Amazonian Bolivia, biogeography.

INTRODUCTION

The Departamento Pando lies entirely within the zone of the seasonal lowland Amazonian rainforest (Anonymus 1999). Since a great deal of this territory is still difficult to access, herpetofaunal diversity of that northernmost Bolivian Departamento remains less surveyed than the herpetofaunas of other regions of Bolivia (see De la Riva et al. 2000, Dirksen et De la Riva 1999, Köhler et Lötters 1999).

The aim of this report is: (1) To provide an annotated list of amphibian and reptile species recorded recently in the vicinity of the settlement of Nacebe, which is located in until now nearly uninvestigated central part of the Departamento Pando. (2) To compare the results obtained with the species composition reported from the surroundings of the town of Riberalta located in Amazonian part of the Departamento Beni at the same latitude as Nacebe.

MATERIAL AND METHODS

The herpetological research activities at the settlement of Nacebe (11° 00' S, 67° 25' W; left bank of the Rio Orthon; Provincia Abuna; Departamento Pando) were performed by the first author between Sept. 26 and Oct. 9, 2003. In total, the investigation took 14 person-days. The surveyed area (up to 8 km straight around Nacebe) included the following basic habitats: (1) open sandy bank of the Rio Orthon; (2) open deforested plots exploited mostly as pastures; (3) secondary bush growths containing small temporal water bodies; (4) more or less disturbed primary terra firme forest; (5) more or less disturbed seasonally flooded primary forest at the forest brooks and lagoons; (6) forest swamps. The elevation of the studied sites ranged around 200 m a.s.l. The locality Puer-

to Rico mentioned in the text represents the town of Puerto Rico Totor (11° 06' S, 67° 33' W).

Families, genera and species are listed in alphabetical order. Selected voucher specimens are deposited in the Colección Boliviana de Fauna – Museo Nacional de Historia Natural, La Paz (abbr. CBF) and in the Department of Zoology, National Museum (Nat. Hist.), Prague (abbr. NMP6V). Where necessary the sex determination was verified by dissection.

The data obtained were compared with the results of faunal survey of the surroundings of Riberalta (11° 00' S, 66° 05' W; ca. 150 km E of Nacebe; Departamento Beni; 175 m a.s.l.) conducted between Nov. 21 and Dec. 6, 1999 (actual field work period Nov. 22–Dec. 5). At both localities the investigations were made using the same method (regular day and night field explorations representing 14 person–days) within similar habitat types (Moravec et Aparicio 2000). The coefficient of biogeographic resemblance was calculated after Duellman et Mendelson (1995). The classification of Bolivian ecoregions was adopted from De la Riva et al. (2000).

SPECIES ACCOUNT

Amphibia

Bufonidae

Bufo guttatus SCHNEIDER, 1799

Material: NMP6V 72166

One subadult specimen (SVL: 55 mm) was found on a path in secondary bush growths at the bank of the Rio Orthon. It corresponds well to the diagnosis given for *B. guttatus* by Lötters et al. (2000). Our record lies ca. 20 km NE of the only other locality reported for this species from Pando (Lötters et al. 2000).

Bufo marinus (LINNAEUS, 1758)

Common species of open and secondary habitats. Subadult specimens were often found burrowed under logs on the wide sandy bank of the Rio Orthon. The SVL of the biggest adult female was 218 mm.

Bufo sp. (*margaritifer* complex)

Material: NMP6V 72167

The taxonomic status of the Pando representatives of *B. margaritifer* complex has not been elucidated completely yet (see Lötters et Köhler 2000). In the vicinity of Nacebe only juvenile specimens dispersing from temporal water bodies in seasonally flooded forest and forest swamps were observed.

Dendrobatidae

Colostethus trilineatus (BOULENGER, 1884)

Material: CBF (2)

Observed after heavy rains in disturbed terra firme forest.

Epipedobates hahneli (BOULENGER, 1884)

Material: CBF (1)

Encountered in a dense humid canopy forest at the edge of forest swamps.

Hylidae

Hyla boans (LINNAEUS, 1758)

Material: NMP6V 72168

Males were calling from the ground or vegetation at the banks of the Rio Orthon and bigger forest brooks. The vocalization started ca. 30 min. before dusk.

Hyla granosa BOULENGER, 1882

An open edge of the forest swamps along the road Nacebe-Dos Calles ca. 4 km N of Nacebe was densely populated by this species.

Hyla joannae KÖHLER et LÖTTERS, 2001

Material: CBF (1), NMP6V 72169/1–2

Our record lies ca. 150 km E of the type locality of this species (Cobija and its vicinity). The three collected males fit fairly well to the original description given by Köhler et Löters (2001). They differ only in slightly larger size (SVL: 18.8–20.9 mm) and in having orange inner iris (bright red in the type series). The males vocalized every night from graminoids and low bushes (up to 150 cm above the water) at the small pond in an open area covered by low secondary growths. They concentrated at the marshy place where the water overflowed the shore vegetation. Their actual number and calling activity positively correlated with heavy rains. The largest observed chorus consisted of ca. 15–20 individuals.

Hyla lanciformis (COPE, 1871)

Commonly heard in open swampy places around Nacebe. Observed also along the road Nacebe-Dos Calles in an area of open marshes surrounded by secondary forest ca. 4 km N of Nacebe.

Hyla marmorata (LAURENTI, 1768)

Material: NMP6V 72170

The collected male vocalized ca. 175 cm above the ground from a “bamboo” stalk at the trail in disturbed primary forest.

Hyla triangulum GÜNTHER, 1869

Material: CBF 5537–38, NMP6V 72050

The finding of *H. triangulum* at Nacebe represents the first record of this species from Bolivia (Moravec et Aparicio 2004). Figs 1–2 show the colour variation in the observed specimens.

Hyla punctata (SCHNEIDER, 1799)

This species formed a dense mixed chorus together with *H. granosa* and *Scinax nebulosus* at the open edge of the forest swamps ca. 4 km N of Nacebe.

Osteocephalus taurinus STEINDACHNER, 1862

Material: CBF (2), NMP6V 72172/1–2

Observed both in flooded and in disturbed terra firme primary forest. Three subadult specimens (SVL: 39.5–59 mm) were found at lower positions up to 170 cm above the ground. One adult female (SVL: 92 mm) and another uncollected adult specimen were sitting on higher branches (ca. 200 and 300 cm above the ground). When disturbed the adults tended to escape to higher positions.

***Osteocephalus* sp.**

Material: CBF (5), NMP6V 72173/1–4

This species represents probably an undescribed taxon (see De la Riva et al. 2002, Jungfer et Lehr 2001, Jungfer et Hödl 2002). Our series comprises of four males (SVL: 35–42 mm) and five females (SVL: 37–48 mm). Both sexes have smooth skin with small tubercles scattered on the head (including loreal region) and dorsum. In some individuals inconspicuous tubercles can be present also on dorsal surfaces of limbs. In the largest females, the tubercles seem to be less prominent than in the smaller individuals, nevertheless, no conspicuous sexual dimorphism in the skin tuberculation was observed. The colouration of the iris is golden to bronze with dark vermiculation and a dark horizontal stripe and it varies from bi-coloured (lower part dark tan to dark brown) to more or less uniform (Figs 3–4). The dorsum of the living individuals is light tan to light brown. The dorsal pattern consists of 4–5 narrow dark transverse blotches being most conspicuous in interorbital, interscapular and middorsal area. Towards the posterior half of the body the blotches tend to break in small dark spots. The anterior and posterior surfaces of thighs are brick red (Figs 5–6). Throat and belly are cream white to yellowish. Individuals of SVL up to 42 mm have green bones whereas the bones of two females measuring 48 mm of SVL are white.

All the observed specimens were sitting at night on vegetation from 20 to 250 cm above the ground along 400 m long trail in disturbed terra firme to flooded primary forest. The males were silent.

In general, the examined individuals seem to belong to the same taxon showing relatively high morphological variability. Nevertheless, the fact, that the individuals having light iris resemble markedly *O. lepriurii* (K.-H. Jungfer pers. comm., May 2004) indicates that the situation might be more complex. Therefore, further investigation of the systematic status of the collected individuals will take place.

***Phrynohyas venulosa* (LAURENTI, 1768)**

Material: CBF (1), NMP6V 72174

The breeding activity of this common species apparently correlated with heavy rains accompanied with an obvious drop of air temperature (to 20 °C). Under such conditions calling males concentrated at fresh shallow temporal water bodies. Strong choruses lasted one night only and took place both in open newly flooded places in the zone of the disturbed seasonally flooded forest and at the puddles in open pastures. In the forest habitat the males called from the ground or from the vegetation near or above the water (up to 2 m).

***Pseudis paradoxa* (LINNAEUS, 1758)**

Material: CBF (1)

This is the first record of *P. paradoxa* for the Departamento Pando. Gallardo (1964) states that in Bolivia the nominotypical subspecies should occur in the area of Amazon tributary system. Similarly De la Riva (1999) presumes that the lowland area of the Departamentos Beni and La Paz as well as the neighbouring part of the Departamento Pando are inhabited by *P. p. paradoxa*. According to this author also the specimens reported by Henle (1992) from Peruvian Bajo Tambopata (Rio Tambopata, Departamento Madre de Dios) as *P. p. occidentalis* represents rather nominotypical subspecies. Nevertheless, De la Riva et al. (2000) noticed that the validity and presence of this subspecies in Bolivia need to be studied.

Our specimen (female, SVL: 65 mm; Figs 7–8) differs in some aspects from the diagnosis given for *P. p. paradoxa* by Gallardo (1961) (conditions described in parentheses): The diameter of tympanum is smaller than the eye diameter (larger) and slightly larger than eye-nostril distance (equal); slight supratympanic fold covers upper margin of tympanic mem-

brane (supratympanic fold not distinct); in alcohol, the dorsal pattern consist of two wide longitudinal dark stripes (four); throat is unspotted (spotted); the dark pattern of the ventral side of the thighs is similar to that one described in *P. p. paradoxa* but consists of five longitudinal lines (four); one long light spot below the cloaca (two). Apparently, some of these and other features correspond to the description of *P. p. occidentalis* GALLARDO, 1961 – e.g. tympanum diameter smaller than eye diameter, slight supratympanic fold, unspotted throat, one light long spot below the cloaca, light spots on the body sides.

It seems that our specimen shows certain similarity with the Peruvian individual described by Henle (1992). As both these specimens do not fit fully to the diagnosis of *P. p. paradoxa*, the subspecific status of the population from the Amazonian Bolivia remains unclear.

During the first five nights three specimens were observed in a small pond in an open area covered by low secondary growths at the Rio Orthon bank. Two females were resting motionless on the vegetation floating on the water surface and one male called partly hidden in the shallow water at the shore. In subsequent nights a young specimen of *Caiman crocodilus* x *C. yacare* occupied the pond and *P. paradoxa* had not been observed any more at the locality.

Scinax ruber (LAURENTI, 1768)

Material: CBF (5), NMP6V 72175/1–4

As usual *S. ruber* was connected with secondary and disturbed habitats. In the investigated area it often formed dense choruses together with *Hyla joanae*, *H. lanciformis*, *H. triangulum* and *Phrynohyas venulosa*. In one case, an interspecific amplexus of a male of *S. ruber* with a male of *P. venulosa* was observed. The male of *S. ruber* held its “partner” in the area of extruded deflated vocal sacs. The couple was sitting motionless in a bush for at least 15 min.

Scinax nebulosus (SPIX, 1824)

Material: NMP6V 72176

Dense assemblage of the calling males was observed along a fast running brook in open forest swamps ca. 4 km N of Nacebe.

Scinax pedromedinae (HENLE, 1991)

Material: NMP6V 72177

One subadult specimen was collected during the day on the floor of disturbed seasonally flooded forest.

Leptodactylidae

Adenomera sp.

Material: CBF (1)

Relatively common species encountered in all types of forest habitats and heard also along the roads and other marginal situations covered by secondary bush growths.

Angulo et al. (2003) reported four different call types representing four morphologically slightly differentiated sympatric species of *Adenomera* from the Tambopata National Reserve (area of the lowland Amazonian rainforest situated in south-eastern Peru at the north-western border of Bolivia). Following the data and terminology given by these authors the individuals observed and collected at Nacebe correspond fairly well to the “Forest Call III” type (not pulsed call to the human ear; dark dorsal pattern consisting of broad discontinuous mid-dorsal stripe, parallel dark spots and dark transverse bars on legs; conspicuously expanded toe tips). In contrast to the habitat preference of this



Figs 1–2. Colour pattern variation in *Hyla triangulum* (left Fig. 1: NMP6V 72050, right Fig. 2: CBF 5538).



Figs 3–4. Iris colouration in *Osteocephalus* sp. (left Fig. 3: NMP6V 72173/1, right Fig. 4: NMP6V72173/2).



Figs 5–6. General colour variation in *Osteocephalus* sp. (left Fig. 5: NMP6V72173/1, right Fig. 6: NMP6V 72173/2).



Fig. 7. *Pseudis paradoxa*, dorsal view.



Fig. 8. *Pseudis paradoxa*, ventral view.

form described by Angulo et al. (2003) (upland forest with well drained sandy soil) this taxon was encountered also in easily flooded closed forest swamps around Nacebe.

Ceratophrys cornuta (LINNAEUS, 1758)

Material: CBF (1)

At night one subadult specimen found after heavy rain on a trail in disturbed terra firme forest.

Eleutherodactylus* cf. *fenestratus (STEINDACHNER, 1864)

Material: CBF (2), NMP6V 72178/1–2

Frequently encountered in disturbed terra firme forest, in secondary growths at the forest edges and also in swamps in closed forest. Usually the males called from the ground covered by leaf litter. Occasionally, they vocalized also from the higher position (up to 60 cm) sitting on clumps of dead leaves captured among branches. Generally, the vocalization started ca. 45 min. before dusk and its intensity decreased obviously 30–60 min. after the dusk (during rainy nights the calling activity was higher and longer). Calling interaction between two males resulting in approaching and following the less active individual by the dominant one was observed.

Leptodactylus bolivianus BOULENGER, 1898

Material: CBF (3), NMP6V 72179/1–4

Common species of the open edge situations. Along trails it intruded also the disturbed terra firme forest.

Leptodactylus leptodactyloides (ANDERSSON, 1945)

Material: CBF (4), NMP6V 72180/1–4

The most abundant frog in the area, which was connected mostly with open and secondary habitats. In forested areas it was encountered along the river or brook banks and on forest trails.

Physalaemus petersi (JIMÉNEZ DE LA ESPADA, 1872)

Material: NMP6V 72181

The only specimen was collected in leaf litter in disturbed terra firme primary forest.

Microhylidae

Elachistocleis bicolor (GUÉRIN MÉNEVILLE, 1838)

Material: CBF (1)

One roadkilled specimen was found on the track between pastures and disturbed secondary forest at the periphery of the settlement of Nacebe.

Hamptophryne boliviana (PARKER, 1927)

Material: CBF (1), NMP6V 71182

Found both in places covered by secondary bushes and in seasonally flooded disturbed forest with thick layer of leaf litter.

Pipidae

Pipa pipa (LINNAEUS, 1758)

An adult specimen observed at night in a larger permanent pond situated at the transition zone between the primary forest and natural forest swamps ca. 4 km N of Nacebe. The given individual was resting motionless at the shore ca. 10 cm under water surface. When disturbed it hid in a thick layer of leaves on the bottom.

Reptilia

Crocodylia

Aligatoriidae

Caiman crocodilus* x *Caiman yacare

According to Brazaitis et al. (1998) the southern limit of the hybrid zone between *C. c. crocodilus* (LINNAEUS, 1758) and *C. yacare* (DAUDIN, 1802) extends along the northern Bolivian border from the Peruvian border in the west to the state of Rhondonia in the east. Here, the hybrid specimens were reported from upper drainages of the Rio Acré and from the Rio Abuna. Our observations show that also the individuals living around Nacebe display the hybrid characters described by Brazaitis et al. (1998) (yellowish body colouration, dark markings on lower jaws and lateral ventral scales not extensive as in *C. yacare*; Fig. 11). This indicates that the southern limit of the occurrence of the hybrid specimens extends at least up to the Rio Orthon.

The caimans were relatively frequently encountered both during the day and at night in all types of larger water bodies (Rio Orthon, forest brooks, lakes, lagoons, temporal ponds in secondary habitats).

***Paleosuchus palpebrosus* (CUVIER, 1807)**

At night one specimen (total length of 710 mm) was caught in fast running stream in natural forest marshes ca. 4 km N of Nacebe. The given individual was hidden in dense submerged vegetation out of the strongest stream.

Squamata: Sauria

Gekkonidae

***Gonatodes humeralis* (GUICHENOT, 1855)**

Encountered mostly along the forest trails. Two individuals were observed also on the external walls of the wooden administrative building in Nacebe. This tendency to synantropic mode of life can be explained by absence of competition from the side of the strongly synantropic *Hemidactylus mabouia*.

***Thecadactylus rapicauda* (HOUTTUYN, 1782)**

One adult male was found under loose bark of a large tree ca. 6 m above the ground.

Gymnophthalmidae

***Iphisa elegans* (GRAY, 1851)**

Material: NMP6V 72183

The Bolivian population should belong to the subspecies *Iphisa elegans soinii* DIXON, 1974. However, our adult male, which possesses well developed narrowly separated prefrontals and 20 femoral-preanal pores, does not show the main diagnostic data given for this taxon (absence of prefrontals, higher average number of femoral-preanal pores: 25.0). The only Bolivian specimen examined by Avila-Pires (1995) and assigned by this author to *I. e. soinii* lacked prefrontals but on the other hand it had similarly low number of femoral pores (21). Therefore, it appears that the subspecific status of the Bolivian population of *I. elegans* needs to be studied in detail.

***Prionodactylus argulus* (PETERS, 1863)**

Material: NMP6V 72184

The collected specimen climbed on a small tree ca. 170 cm above the ground in a closed forest swamp.



Fig. 9. Adult specimen of *Mabuya nigropalmata*, NMP6V 72186, SVL: 60 mm.



Fig. 10. Juvenile specimen of *Mabuya nigropalmata*, SVL: 31 mm.



Fig. 11. Juvenile specimen of *Caiman crocodilus crocodilus* x *Caiman yacare*.



Fig. 12. *Oxyrhopus* cf. *petola*.

Prionodactylus eigenmanni GRIFFIN, 1917

Material: CBF (1)

Caught in leaf litter on a sunny spot in primary terra firme forest.

Iguanidae

Iguana iguana (LINNAEUS, 1758)

Material: CBF (1)

As the local people do not hunt this reptile it does not avoid ruderal places and occurs even inside the settlements and towns (Nacebe and Puerto Rico). Around Nacebe it was observed mainly at the bank of the Rio Orthon and along the larger forest brooks. At night large sleeping individuals were discovered on horizontal branches extending above the water. One nest containing 19 eggs was found on the sand beach at Nacebe. The nest was located ca. 35 m from the water and ca. 60 m from the line of shore vegetation. The eggs were partly uncovered by a heavy night rain which washed away the sand and just predated by birds (*Phaetusa simplex*). Originally, the eggs were deposited ca. 26–29 cm deep. The temperature inside the nest hole was 26.4 °C at 9:00 a.m. One of the two damaged eggs contained embryo measuring 41.0 mm of SVL and 69.0 mm of tail length. Two other eggs were moulded. The average size (length/width) of the remaining 15 eggs was: 47.7/34.2 mm (range: 50.9–37.9/36.1–30.9 mm).

Polychrotidae

Anolis fuscoauratus DUMÉRIL et BIBRON, 1837

Material: CBF (1)

Only four specimens (both uniform and longitudinally striped colour morph) were observed along the forest trails and at the edge of forest swamps.

Anolis punctatus DAUDIN, 1802

Material: CBF (1), NMP6V 72185

This species inhabited disturbed primary forest. The sitting positions of the three found adult individuals did not exceed the height of 150 cm. One disturbed specimen hid under a large fallen tree trunk. The collected males changed rapidly the body colour from bright green to dark grey or dark brown.

Scincidae

Mabuya nigropalmata ANDERSON, 1918

Material: CBF (1), NMP6V 72186

Until now *M. nigropalmata* has been known from the type localities only (Rio Curucá, W Brazil and San Fermin, NW Bolivia). Our two specimens correspond fairly well to the characteristics given for the type series by Avila-Pires (1995). Colouration of the live specimens is figured on the Figs 9–10. The bright blue tail is a characteristic feature of the juvenile individuals. The blue colour fades with the age but the bluish tinge of the tail persists also in adults.

Around Nacebe this species commonly inhabited sunny margins of the roads and trails in secondary or disturbed primary terra firme forest. Usually it basked on the ground or on fallen tree trunks but could climb up to 5 m high. One specimen was also found inside a wooden house in the settlement. In comparison with sympatric *M. nigropunctata* it appeared to be more tolerant to open and secondary situations.

Mabuya nigropunctata (SPIX, 1825)

Material: CBF (1)

This skink usually occupied open sunny edges of trails and artificial or natural forest clearings.

Teiidae

Ameiva ameiva (LINNAEUS, 1758)

Common reptile of the open secondary habitats. Locally it burrowed shelters also on sunny parts of the wider forest trails.

Kentropyx altamazonica COPE, 1876

Material: NMP6V 72187

This species was connected with different sunny places and small clearings in the seasonally flooded forest surrounding a lake ca. 6 km NW of Nacebe. Fresh juveniles were found also along the close forest trail.

Tupinambis teguixin (LINNAEUS, 1758)

Adult specimens were seen in the area of seasonally flooded forest and in disturbed terra firme forest.

Tropiduridae

Plica plica (LINNAEUS, 1758)

Material: CBF (1)

P. plica occupied the trunks of large trees in disturbed primary and primary forest. In one case three individuals (adult, subadult and juvenile) lived on the base of an extraordinary large tree.

Squamata: Serpentes

Colubridae

Helicops angulatus (LINNAEUS, 1758)

At night two adult specimens were found in a shallow flooded depression in an open spot surrounded by seasonally flooded forest. A dense assemblage of breeding *Phrynohyas venulosa* and *Scinax ruber* was concentrated at this place. One of the snakes was disturbed just at the moment when held the hind leg of an adult *P. venulosa*.

Imantodes cenchoa (LINNAEUS, 1758)

After dusk one adult individual slowly exploring a large heap of dry branches at the edge of a forest trail was observed.

Liophis reginae (LINNAEUS, 1758)

Material: CBF (1)

One juvenile specimen (total length: 183 mm) caught in a forest lake ca. 15 m from the shore.

Oxyrhopus* cf. *petola (LINNAEUS, 1758)

Material: CBF (1)

The only obtained specimen (Fig. 12) is a male of 590 mm of SVL and 360 mm of tail length. It has 7/8 upper labials, 1/1 preoculars, 3/3 postoculars, 19 dorsals in midbody, entire anal shield, 227 ventrals and 114 pairs of subcaudals. The preoculars are well separated from frontals and the dorsals have two apical pits. The head is black dorsally with

an orange medially divided nuchal blotch. Dorsum and belly are black with alternating cream lateral spots (16 spots on each side of the body, one fused spot in the cloacal region, irregular traces of reduced spots on the tail; some of the spots contain orange scales dorsally). The lateral spots have more or less triangular shape (at the base they correspond to 4–1 ventrals and the dorsal top includes 2–1 dorsals) and do not exceed the middle of the dorsum. Ventrally they reach onto outer third of ventrals or to midventral line (in three cases the opposite spots meet or fuse each other on the belly).

In comparison with the general data given for *O. petola* or its subspecies *O. p. digitalis* (REUSS, 1834) (e.g. Boulenger 1896; Peters et Orejas-Miranda 1970; Dixon et Soini 1977; Pérez-Santos et Moreno 1988, 1991; Duelman et Mendelson 1995, Lehr 2002) our specimen differs in higher number of postoculars (generally two) and ventrals (upper limit 222). The unusual belly colouration (normally light dorsal bands extend onto tips of ventrals only) can be perhaps seen in the light of the tendency to ontogenetic melanism in *O. p. digitalis* (see Boulenger 1896; Peters et Orejas-Miranda 1970).

The given individual climbed at night on a horizontal branch ca. 175 cm above the ground in disturbed terra firme forest.

***Spilotes pullatus* (LINNAEUS, 1758)**

Adult specimen observed on a sunny edge of clearing in disturbed forest.

Testudines

Pelomedusidae

***Podocnemis unifilis* TROSCHER, 1848**

This turtle occurs both in the Rio Orthon and in forest lakes or lagoons around Nacebe. During the day the turtles often basked on the tree trunks fallen to the water. The apparent scarcity of basking opportunities led the turtles to aggregate (up to 11 individuals) on the suitable places.

The local people commonly hunt this species and collect its eggs. Both collected eggs and the killed females were seen in Puerto Rico on Sept. 26. On Oct. 9 the local fisherman serving the transport on the Rio Orthon searched for turtle eggs along ca. 15 km long transect of the riverbanks between Nacebe and Puerto Rico. In all, the fisherman found seven female tracks and discovered and inspected two nests. The first contained 19 fresh eggs (length/width of the measured one: 41.6/28.6 mm). The second contained only three older deteriorated eggs. The nests were located on wide sandy beaches ca. 30 m from the water and the eggs were deposited ca. 15 cm deep in the faint sand. Track of one freshly hatched juvenile was found on the beach at Puerto Rico on Oct. 10.

FAUNISTIC AND ZOOGEOGRAPHICAL NOTES

A comparison of the 50 species of amphibians (28) and reptiles (22) recorded from the vicinity of Nacebe in this paper with the recent lists of the Bolivian herpetofauna (De la Riva et al. 2000, Dirksen et De la Riva 1999) shows that nine amphibian species (*Ceratophrys cornuta*, *Hyla boans*, *H. triangulum*, *Osteocephalus taurinus*, *Osteocephalus* sp., *Pipa pipa*, *Physalaemus petersi*, *Pseudis paradoxa*, *Scinax nebulosus*, *S. pedromedinae*) and six reptile species (*Anolis fuscoauratus*, *Iphisa elegans*, *Kentropyx altamazonica*, *Mabuya nigropalmata*, *M. nigropunctata*, *Prionodactylus argulus*) were not reported for Pando in these overviews. Moreover, one of the frog species (*Hyla triangulum*) was also added to the general faunal list of Bolivia (Moravec et Aparicio 2004). This indicates that our knowledge

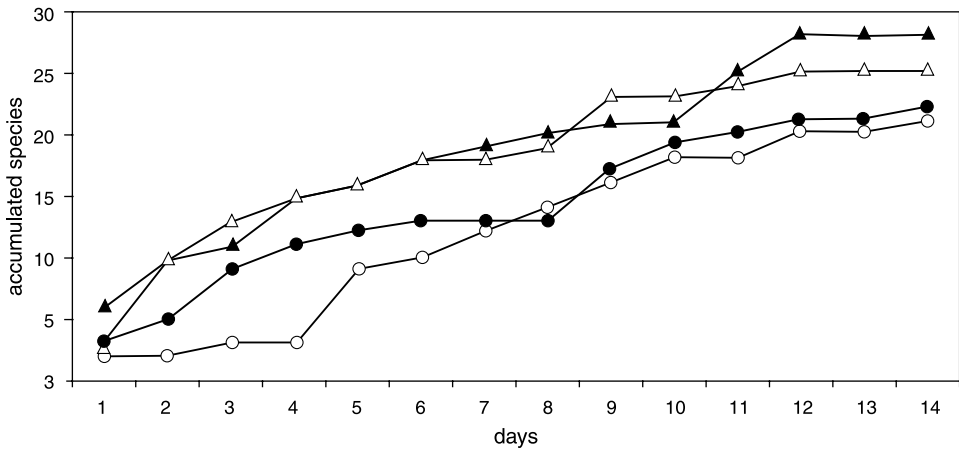


Fig. 13. Species accumulation curves (closed triangles = amphibians Nacebe, open triangles = amphibians Riberalta, closed circles = reptiles Nacebe, open circles = reptiles Riberalta).

of the herpetofaunal richness of Pando is still very incomplete and does not provide a realistic picture of the species diversity of this part of the Bolivian Amazonia.

Nevertheless, despite the short-term nature of the field investigation the results obtained from the vicinity of Nacebe can be compared with the data available from the surroundings of the town of Riberalta located ca. 150 km east of in the Departamento Beni (Moravec et Aparicio 2000). Curves of species-discovery rates indicate that the faunas of the both localities were surveyed more or less evenly (Fig. 13). The recorded species diversity was similar (Nacebe/Riberalta: 28/25 amphibian species, 22/21 reptile species) and in total 13 amphibian and 9 reptile species occurred both localities. The coefficient of biogeographic resemblance (CBR) for the entire herpetofaunas (CBR: 0.46) corresponds to the lower values of CBR (range: 0.42–0.67) found by Duellman et Mendelson (1995) for the localities in the northern part of Peruvian Amazonia. The similarity between Nacebe and Riberalta is higher among amphibians (CBR: 0.49) than in reptiles (CBR: 0.42). This probably reflects the less complete sampling success in reptiles. Therefore, only amphibian samples were used for the evaluation of the zoogeographic affinity of the studied faunas. The non-Amazonian species (core of their distribution lies in Chaco or Cerrado domains) were represented by one (3.6%) species (*Elachistocleis bicolor*) in Nacebe and by seven (28.0%) taxa (*Bufo granulatus mini*, *Elachistocleis bicolor*, *Leptodactylus elenae*, *L. podicipinus*, *Lysapsus limellus*, *Hyla nana*, *H. raniceps*) in the Riberalta sample. The markedly higher proportion of the non-Amazonian elements in Riberalta is an apparent consequence of the closer position of Riberalta to open habitats of Campos Cerrados and wet savannas covering central and eastern parts of the Bolivian lowlands (see Anonymus 1999, De la Riva et al. 2000). Owing to actual forest disturbance, these anurans can extend their ranges in north and northwest direction to southern Amazonia. The question is why some of them (e.g. *Bufo granulatus mini*, *Leptodactylus elenae*, *L. podicipinus*, *Hyla nana*, *H. raniceps*), which form dense populations at Riberalta, were not recorded also around Nacebe. This fact may indicate that the river system of the Rio Madre de Dios and Rio Beni, which runs between the investigated localities, works as a natural barrier for dispersal of the southern or south-eastern elements to the north.

ACKNOWLEDGEMENTS

We would like to thank Dr. Jörn Köhler (Zoologisches Forschungsinstitut und Museum A. Koenig, Bonn) for his valuable comments on the manuscript and collected material. We are grateful to Dr. Karl-Heinz Jungfer (Gaildorf) for his comments on the material of *Osteocephalus* sp. The first author is much obliged to Ing. Francisco Bautista Vila (La Paz), Miriam and Kjetil Halvorsens (La Paz), Dr. Gabriel Silva (Cobjija) and Carlos Gutierrez Rea (Santa Cruz de la Sierra) for their kind help and hospitality. The research was supported by the Czech Ministry of Culture – project no. MK0CEZ99F0201. Collecting permit in Bolivia was issued by CBF – Museo Nacional de Historia Natural, La Paz (Blgo. Jaime Sarmiento).

REFERENCES

- Angulo, A., Cocroft, R. B., Reichle, S. (2003): Species identity in the genus *Adenomera* (Anura: Leptodactylidae) in southeastern Peru. – *Herpetologica*, 59: 490–504.
- Anonymus (1999): Bolivia. Un mundo de potencialidades. Atlas estadístico de Municipios. – Centro de Información para el Desarrollo, Rosendo Gutierrez, 595 esq., Ecuador.
- Avila–Pierres, T.C.S. (1995): Lizards of Brazilian Amazonia (Reptilia: Squamata). – *Zoologische Verhandlungen*, 299: 1–706.
- Boulenger, G. A. (1896): Catalogue of the snakes in the British Museum (Natural History). – Vol. 3., London. (Reprinted: J. Cramer and Wheldon & Wesley, Ltd. and Hafner Publishing co., 1961).
- Brazaitis, P., Rebelo, G. H., Yamashita, C. (1998) The distribution of *Caiman crocodilus crocodilus* and *Caiman yacare* populations in Brazil. – *Amphibia-Reptilia*, 19: 193–201.
- De la Riva, I. (1999): Notes on the paradox frog, *Pseudis paradoxa*, in Bolivia. – *Brit. Herp. Soc. Bull.*, 68: 14–19.
- De la Riva, I., Köhler, J., Lötters, S. (2000): Ten years of research on Bolivian amphibians: updated checklist, distribution, taxonomic problems, literature and iconography. *Rev. Esp. Herp.*, 14: 19–164.
- Dixon, J. R., Soini, P. (1977): The reptiles of the Upper Amazon basin, Iquitos region, Peru. II. Crocodylians, turtles and snakes. – *Milwaukee Public Mus. Contrib. Biol. Geol.*, 12: 1–91.
- Dirksen, L., De la Riva, I. (1999): The lizards and amphisbaenians of Bolivia (Reptilia, Squamata): checklist, localities, and bibliography. – *Graellsia*, 55: 199–215.
- Duellman, W. E., Mendelson, J. R. (1995): Amphibians and reptiles from northern Departamento Loreto, Peru: Taxonomy and biogeography. – *Univ. Kansas Sci. Bull.*, 55: 329–376.
- Gallardo, J. M. (1961): On the species of Pseudidae (Amphibia, Anura). – *Bull. Mus. Comp. Zool., Harvard*, 125: 111–134.
- Gallardo, J. M. (1964): Una nueva forma de Pseudidae (Amphibia, Anura) y algunas consideraciones sobre las especies Argentinas de esta familia. – *Acta Zoologica Lilloana*, 20: 193–209.
- Henle, K. (1992): Zur Amphibienfauna Perus nebst Beschreibung eines neuen *Eleutherodactylus* (Leptodactylidae). – *Bonn. Zool. Beitr.*, 43: 79–129.
- Jungfer, K.-H., Hödl, W. (2002): A new species of *Osteocephalus* from Ecuador and a redescription of *O. lepieurii* (Duméril & Bibron, 1841) (Anura: Hylidae). – *Amphibia-Reptilia*, 23: 21–46.
- Jungfer, K.-H., Lehr, E. (2001): A new species of *Osteocephalus* with bicoloured iris from Pozuzo (Peru: Departamento de Pasco) (Amphibia: Anura: Hylidae). – *Zool. Abh. Mus. Tierkde Dresden*, 51: 321–329.
- Köhler, J., Lötters, S. (1999): Annotated list of amphibian records from the Departamento Pando, Bolivia, with description of some advertisement calls. – *Bonn. Zool. Beitr.*, 48: 259–273.
- Köhler, J., Lötters, S. (2001): A new species of minute *Hyla* from the southwestern Amazon Basin (Amphibia, Anura, Hylidae). – *Studies on Neotropical Fauna and Environment*, 36: 105–112.
- Lehr, E. (2002): Amphibien und Reptilien in Peru. – *Natur und Tier Verl., Münster*, 208 pp.
- Lötters, S., De la Riva, I., Reichle, S., Soto, G. (2000): First records of *Bufo guttatus* (Amphibia: Bufonidae) from Bolivia, with notes on *Bufo glaberrimus*. – *Bonn. Zool. Beitr.*, 49: 75–78.
- Moravec, J., Aparicio, J. (2000): Amphibians and reptiles recently recorded from the surroundings of Riberalta (Departamento Beni, Bolivia). – *Čas. Nár. muz., Ř. Přírodověd.*, 169: 1–15.
- Moravec, J., Aparicio, J. (2004): First record of *Hyla triangulum* Günther, 1869 from Bolivia. – *Herpetozoa*, 17: in press.
- Pérez-Santos, C., Moreno, A. G. (1988): Serpientes de Colombia. – *Museo Region. Sci. Naturali, Monografie VI. Torino*, 517 pp.
- Pérez-Santos, C., Moreno, A. G. (1991): Serpientes de Ecuador. – *Museo Region. Sci. Naturali, Monografie XI, Torino*, 538 pp.
- Peters, J. A., Orejas-Miranda, B. (1970): Catalogue of the Neotropical Squamata. Part. I. Snakes. – *Bull. U. S. Nat. Mus. Bull.*, 297: viii+347.