Christian Langner, Beate Pfau, Ronny Bakowskie,
Clara Arranz und Axel Kwet

Evaluation of the Captive Breeding Potential of selected Reptile Taxa included in Appendices I and II at CITES CoP17

Federal Agency for Nature Conservation

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Cover picture: *Shinisaurus crocodilurus* (Photo: Axel Kwet)

Authors' addresses:

German Society for Herpetology and Herpetoculture e.V. (DGHT)

Christian Langner	Head International Centre for Turtle Conservation (IZS) Allwetterzoo Münster Altätte 23, 48727 Billerbeck E-Mail: Langner@allwetterzoo.de
Dr. Beate Pfau	Rathenaustrasse 14, 65326 Aarbergen E-Mail: Beate.Pfau@gmx.net
Ronny Bakowskie	Täubchenweg 12, 04317 Leipzig E-Mail: Bakowskie@web.de
Dr. Clara Arranz	Ludwig-Herr-Strasse 49, 79713 Bad Säckingen E-Mail: clara.arranz.10@gmail.com
Dr. Axel Kwet (Geschäftsführer DGHT)	DGHT-office Vogelsang 27, 31020 Salzhemmendorf E-Mail: kwet@dght.de

Scientific Supervision at BfN:

Dr. Mona van Schingen-Khan	Division II 1.1 „Wildlife Conservation"

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Preface

The European Union (EU) is one of the global major importers of living reptiles, as well as their parts and products (such as leather). The Convention of International Trade in Endangered Species of Wild Fauna and Flora (CITES) regulates the international trade in species listed in the Appendices of the convention.

Since several years, a shift of the international reptile trade from wild specimens towards specimens bred in captivity is recognized. About 83% of traded reptiles are claimed not to be of „wild“ source. However, these source codes are in some cases highly questionable. As such, the verification of the captive breeding of specimens poses an increasing challenge to national and international CITES authorities and became of increasing significance for the work of international bodies of the convention.

Comprehensive information on the reproduction and husbandry requirements of traded species are crucial for making plausibility findings of captive breeding data. However, especially for species that are rarely kept in captivity, newly described or poorly studied, the relevant data is lacking or not accessible.

As Germany further is a main transit country in the reptile trade within the EU, the country has a high responsibility for the conservation of traded species. Therefore, the present guidance for CITES authorities has been developed to improve the plausibility finding of the captive breeding of selected species.

There are several specialist keepers in Germany, who have great experience in keeping and breeding of rare reptile taxa, however in many cases these data remain unpublished.

The German Society of Herpetology and Herpetoculture (DGHT) has thus been commissioned to requested relevant reproduction data from private keepers and zoological institutions, to carry out a literature survey and together with their own expertise develop the current guidance. The selection of species for which these data were collected included those reptile taxa, which were included or uplisted in the CITES Appendices I and II at the previous CITES CoP17. This contribution should assist CITES authorities in carrying out the plausibility check for the captive breeding and should improve the implementation of the CITES convention.

Prof. Dr. Beate Jessel

President of the Federal Agency for Nature Conservation

Aims of the Project

Germany ranks amongst the major importers of live reptiles for the pet industry both within the EU and on a global scale. One particular problem here is the trade in wild-caught specimens that are furnished with fake certificates of origin and are declared as captive-bred (e.g., “farmed”) stocks, as this effectively thwarts in part the aims of CITES (Convention on International Trade in Endangered Species of Wild Fauna and Flora) intended to protect certain species by keeping wild-caught specimens of these out of the commercial trade or at least requiring that strict preconditions be met (Appendix I, A), or to facilitate only their sustainable, controlled trade (Appendix II, B). National and international CITES authorities and scientific institutions within Germany and the EU are thus faced to an ever-increasing extent with questions related to the verification and validation of allegedly captive-bred specimens of CITES listed reptile species.

The DGHT has, in the framework of its Project “Evaluation of the captive breeding potential of selected Reptile Taxa included in Appendices I and II at CITES CoP17 (FKZ 3518 53 2011)”, conducted a pilot project on the concrete evaluation of this situation in the CITES-relevant reptile species mentioned below. The project goal here has been to compile all available data and information on the reproduction biology and breeding ability of the species listed in the CITES Appendices I and II at CoP17 in 2016.

The sources of information on each species, which were compiled fort he first time in this comprehensiveness for the first time within this project, are meant to provide scientists and the representatives of authorities with a basis upon which they may evaluate the plausibility of alleged captive-bred specimens from questionable sources and uncover misrepresented specimens in the future. To this end, fact sheets on each species have been authored in both German and English, and corresponding ID photographs have been made available as JPEGs. A simple traffic light labelling system furthermore facilitates an evaluation of the degree of difficulty and frequency of successful captive breeding of these species in captivity and/or the quantities of captive offspring obtainable under various husbandry conditions.

Methods

As a first step, a questionnaire on breeding characteristics, provided by the BfN has been amended to the three relevant taxonomic groups of reptiles, i.e., lizards, snakes, and chelonians, obtaining consent from the BfN on a coordination meeting in November of 2018, and then mailing these sheets to private breeders and zoological gardens. In addition, numerous breeders in Germany, Europe and North America were contacted personally (by E-mail or phone), because the return rate of completed questionnaires was rather poor.

A close cooperation with the different DGHT Work Groups was essential in order to identify relevant persons, which could aid to create reproducible data pools. Amongst their members, experts can be found who focus in particular on the taxa that are to be evaluated (especially in the Work Groups Chelonians, Snakes, Lizards, and Chameleons). These work groups consist of numerous interested, specialist and experienced keepers, who party have been focusing on the captive breeding and husbandry of certain species for decades. As such, these breeders tend to be firmly embedded in partly far-reaching networks within the private “breeder scene”. The DGHT Work Groups benefit from comprehensive sources of information, such as experiences in the successful captive breeding and research on certain taxa for decades. For example, the Work Group Chelonians has been gathering data and consolidating these in captive breeding statistics for more than fourty years.

Being the largest herpetological society in the world, the DGHT with its scientific flagship journal “Salamandra” is furthermore renowned for its excellent cooperation and networking on an international scale. Many DGHT members in fact participate in an active manner in international captive-breeding projects, one example being *Shinisaurus crocodilurus*, within the framework of the European Studbook Foundation.

Based on questionnaires returned as well as numerous E-mails and information obtained via phone, the second stage consisted of incorporating information obtained from subject literature (following extensive literature research), and pooling everything in species-specific accounts that now contain all presently available data on reproduction-related parameters. Each species-specific account includesa photograph, data on its natural habitat and distribution, threat status, all relevant and available information on its reproduction both in the wild and in human care, and a species-specific list of references (a complete list was added as an appendix for some species).

Target Species

CITES Appendix I (A: The commercial trade in individuals taken from nature is by default illegal, but the trade in captive-bred specimens and for non-commercial purposes may be sanctioned in exceptional instances, necessitating both export and import permits, is subject to strict controls, and is only permissible if such will conform to national legislation and not compromise the continued existence of the respective species in the wild) lists the following reptile species (as of CITES CoP17):

- *Abronia anzuetoi, A. campbelli, A. fimbriata, A. frosti, A. meledona*,
- *Cnemaspis psychedelica*,
- *Shinisaurus crocodilurus* (from CITES Appendix II to Appendix I),
- *Lygodactylus williamsi*.

CITES Appendix II (B: Sustainable use and controlled commercial trade are permissible if such will not compromise the continued existence of the respective species in the wild, necessitating export permits from the exporting country, monitoring measures, and clearance certification) lists the following reptile species (as of CITES CoP17):

- all other species of *Abronia* (actually 24 taxa) if not listed in Appendix I,
- *Paroedura masobe*,
- all species in the genus *Rhampholeon* (18 taxa) and genus *Rieppeleon* (3 taxa),
- *Lanthanotus borneensis*,
- *Atheris desaixi*,
- *Bitis worthingtoni*,
- six species of softshell turtles from Africa and Asia, *Cyclanorbis elegans*, *C. senegalensis*, *Cycloderma aubryi*, *Cycloderma frenatum*, *Trionyx triunguis*, *Rafetus euphraticus*.

In addition, a further fact sheet has been produced for the highly trade-relevant *Testudo horsfieldii* of the family Testudinidae.

Glossary

Symbols Evaluating the Captive Breeding Potential

This species is easily maintained and bred in captivity, but not necessarily a species for beginners.

This species is easy to maintain and breed by an expertised keeper, if the required conditions are given. Not for beginners or laity persons.

The species can be kept and bred in captivity, but its requirements are solely achievable by specialized and experienced keepers. The species is estimated as impossible to be bred commercially in large numbers.

X As far as known, no keeping and breeding experience for the species is established.

Relevant CITES Source Codes

C	CITES Source code "captive bred" (use i.e. in CITES Trade database); specimens, which were born or hatched under controlled settings and comply with the requirements for the origin "C" according to the ITES Res. Conf. 10.16. This labeling should not get mixed up with the German term NZ (Nachzucht)
F	CITES Source code "Captive born"; specimens born or hatched under controlled settings, which do meet the requirements for "C" (vid. sup.) according CITES Res. Conf. 10.16.
I	CITES Source code for confiscated or seized specimens
O	CITES Source code for pre-convention; the specimen was obtained before CITES listing of the species
R	CITES Source code "ranched"; eggs larvae or juveniles were taken from the wild and were raised under controlled captive conditions. Usually some part of the raised adults is exposed back to the wilderness
W	CITES Source code for wild caught animals

Abbreviations and Technical Terms

♂; ♂♂	One male; several males
♀; ♀♀	One female; several females
1.2.3	Group composition; first position: number of males, second position: number of females, third position: number of juveniles of unknown sex
Adult; Adultus	Full grown resp. sexually mature specimen(s)

Aquatic	Living in water (semi-aquatic: spending parts of their time or life-cycle in water)
Arboricol	Arboreal; living in trees
Autopsy	An autopsy or post-mortem examination is a surgical procedure that consists of a thorough examination of a corpse by dissection to determine the cause, mode and manner of death or to evaluate any disease or injury that may be present for research or educational purposes
Captive breeding	(Continuous) reproduction of a species in captivity
Carapax	Carapace of turtles and tortoises
CB	Captive bred
CL	Carapace length (length of turtles and tortoises)
Cloaca	A cloaca is the posterior orifice that serves as the only opening for the digestive, reproductive, and urinary tracts of many vertebrate animals (all amphibians and reptiles); opening at the vent
Dorsal	Anatomical term of location referring to the back or upper side of an organism
Endoscopy	The endoscopy procedure uses an endoscope to examine the interior of a hollow organ or cavity of the body with the help of an optical probe head
Epiphyte	An epiphyte is an organism that grows on the surface of a plant and derives its moisture and nutrients from the air and rain or from debris accumulating around it
F1, F2	First or second offspring generation (= filial generation)
Frontline®	Treatment agent for snake mites *Ophionyssus natricis.* Active substance is Fipronil; discuss treatment with a vet or experienced keepers
Gestation	Pregnancy
Gular fold	A transverse running fold across the throat of some lizards
Habitat preference	The habitat most likely to be chosen by a species
Hatchling	Freshly hatched juvenile
Helmet	The helmet is an attribute all chameleons possess at the back of the head
Hemipenis	A hemipenis (plural hemipenes) is one of a pair of intromittent sexual organ of male squamates (snakes, lizards) exhibit
Humidity	Relative atmospheric humidity. Important for the incubation of reptile eggs
Invasive	„Penetrating“ surgical intervention through the skin
IUCN	International Union for Conservation of Nature

Lecithotrophy	A form of development in which the embryo receives no nutrition other than the yolk originally contained within its egg. Some reptile species give birth to live offspring, which were not provided with nutrients via a placenta but via the egg yolk. Offspring hatches out of the permeable egg at birth
Mimesis	The ability of a species to camouflage in its surroundings in coloration or body shape
Monotypical	A taxon, which includes just a single subordinated taxon, i.e., a genus with just one species or a species with just one subspecies
Osteoderms; Osteodermal scales	Ossified dermal scales
Ovarian follicle	An ovarian follicle is a roughly spheroid cellular aggregation set found in the ovaries
Oviparous	Egg laying
Oxytocin	Hormone (or hormone preparation). Oxytocin is used as a medication to facilitate birth
Pressure immobilisation technique	The pressure immobilisation technique is a first aid treatment used for treating spider bites, snake bites, or bee, wasp and ant stings in allergic individuals, blue ringed Octopus stings, cone shell stings, etc. The object of pressure immobilisation is to contain venom within a bitten limb and prevent it from moving through the lymphatic system to the vital organs. This therapy has two components: pressure to prevent lymphatic drainage, and immobilisation of the bitten limb to prevent the pumping action of the skeletal muscles. This method is not undisputed
Probing	Sexing method for squamates with a special needle sonde. Only recommended for experienced keepers
Rearing	To care for young animals under captive conditions until they reach maturity (rearing cannot be equated with captive breeding; see there)
Saxicolous	Stone dwelling; living or growing among rocks
Sexual dichromatism	Special form of sexual dimorphism where coloration of sexes is different
SD	Sex Determination; TSD: Temperate dependent Sex Determination
Siena	The clay soil near Siena, Italy, shows a yellowish to red brown coloration called raw siena
Sperm storage (Amphigonia retardata)	“Amphigonia retardata" is a term synonymous with "delayed fertilization" involving the storage of viable sperm by a female. More specifically, it may be defined as the union of egg and sperm after the male gametes have been retained in the

	genital tract for a considerable period after copulation. It occurs in testudines and squamates
Squamata	Squamata is the largest order of reptiles, comprising lizards and snakes, which are known as squamates or scaled reptiles. With over 10.350 recognized species
Subadult	Half grown. Sex is sometimes determinable in this stage of development
Sublabialia	Scales of bottom lips in reptiles
Supplementation	Complementation of vitamins and minerals to the food. Insects, for example, are dusted with a vitamin/mineral powder to upgrade the nutritional value
Supra-auricular scales	Spinelike scales above the auricular opening. The scale patterns of the genus *Abronia* are explained in CAMPBELL & FROST (1993), the English denomination is found in the identification guide of SÁNCHEZ-HERRERA et al. (2017)
SVL	Snout-vent length
Taxon	In biology, a taxon is a group of one or more populations of an organism or organisms seen by taxonomists to form a unit. Plural: taxa
TL	Total length
Trigger	Stimulation
Tubercle scales	Thornlike scales
Typus/type	Individual in biological nomenclature that serves to define the features of a particular taxon
Type locality	The place where a type specimen was found
Ventral	Anatomical term of location referring to the venter or lower surface of an organism
Viviparous	Live bearing
WC	Wild caught

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Lizards – Anguidae

Abronia anzuetoi CAMPBELL & FROST, 1993

Anzueto's Arboreal Alligator Lizard

German: Anzuetos Baumschleiche

Morphology

Snout-vent length up to 135 mm.

The dorsal coloration of *Abronia anzuetoi* is emerald green with individual yellowish-green dorsolateral scales. It has a yellowish eye ring, and the iris is yellow. The ventral side is also bright yellow. The scales along the ventrolateral fold are blue green in color. The characteristic yellow, spinelike supra-auricular scales classifies it into the subgenus *Aculabronia*.

Geographic distribution, Habitat

Southern Central Guatemala at 1219 - 2286 m asl.

Type locality: Cloud forest at 1219 m asl on the southern slope of the volcano de Agua, Finca Rosario Vista Hermosa, District of Escuintla, Guatemala. Linear distance 12 km north-northeast of Escuintla, ca. 14° 25' N, 90° 44' W.

Conservation status and main threats

CITES Appendix I since 2016 (CoP17 Proposal 25).

EU Regulation 2017/160 [EG]: Annex: B.

In Germany strictly and particularly protected under BNatSchG [BG] Status: s.

IUCN- Red List status: VU – Vulnerable D2 (assessed 6 May 2012).

The current status of the species is completely unknown. The IUCN assessment states that the forest where it occurs may be converted to coffee plantations if the price of coffee continues rising. With respect to this threat, there appear to be fewer than five locations.

A survey is urgently required to evaluate the real threats to this rare species, whose distribution is most likely fragmented in small areas.

The main threat for all arboreal alligator lizards is the massive habitat destruction. Cloud forests of Central America are one of the most endangered habitats worldwide. Illegal collection for the pet trade and killing by locals pose further threats. Arboreal alligator lizards are thought to be highly venomous and killed when seen by locals.

Reproduction

No data available.

Husbandry and captive breeding X

According to records, *Abronia anzuetoi* has not been kept in captivity.

Given that the species is not yet extinct, an *ex situ* breeding project is urgently recommended.

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Abronia aurita (COPE, 1869)

Cope's Arboreal Alligator Lizard

Spanish: Dragoncito de la Cordillera de Verapaz

German: Ohrenbaumschleiche

Abronia aurita Photo Credit: Christian Langner

Morphology

Snout-vent length: 125 cm.

The dorsal coloration of *Abronia aurita* varies from green, yellowish-green to turquoise. Some of the dorsal scales possess pigmented areas. The head scales show fine pigmentation. Males head scales have commonly visible orange coloration on the pointing end. The orange coloration at the scale end can also occur along the dorsal scales, making this arboreal alligator lizard one of the most colorful species of its genus. The rostral, infralabial, ocular and supra-auricular scales are bright yellow.

The supra-auricular scales (above the auricular opening) are spinelike and classify *Abronia aurita* as one representative of the subgenus *Aculabronia*. The venter is yellowish or cream to greenish- white. The overall ground color of juveniles is light brown. They possess 8 to 10 crossbands along the dorsum. In juveniles, the spinelike ends of the supra-auricular scales are not yet developed.

Geographic distribution, Habitat

Abronia aurita is found in the central plateau of Guatemala. Besides the department of Alta Verapaz in Guatemala. South east of Mexico is also listed in the Reptile Database as a possible distribution area. Yet this last locality is questioned and to date no information sources about this locality are given. In the past *Abronia vasconselosii* was misallocated to *A. aurita* (CAMPBELL & FROST 1993). This leads to considerable misperceptions of the distribution ranges of both species, which evidently overlap and are, to date, still unclear. Meanwhile, both species are considered distinct species.

Conservation status and main threats

CITES Appendix II since 2016 (CoP17 Proposal 25).

EU Regulation 2017/160 [EG]: Annex: B.

In Germany strictly and particularly protected under BNatSchG [BG] Status: b.

IUCN-Red List status: EN - Endangered B1ab(iii) (assessed 6 Mai 2012).

The main threat for all arboreal alligator lizards is the massive habitat destruction. Cloud forests of Central America are one of the most endangered habitats worldwide. Illegal collection for the pet trade and hunting by rural people pose further threats. Arboreal alligator lizards are thought to be highly venomous and killed when seen.

Reproduction

Secondary sexual traits	♀♀ more slender than ♂♂; head of ♂♂ wider and more prominent
Sexual maturity	With about 2 years
Reproduction	Viviparous
Mating season	End of summer / autumn. The copula can take several hours and even days
Birth season	March /April
Litter size (Min. – Max.)	7 - 16
Gestation period	Up to 8 months
F2 Generation bred	Yes
Offspring size / weight	3 cm / 1 g
Sperm storage	Unknown

Husbandry and captive breeding 

Trigger for Reproduction (e.g. technical equipment, care, social and climatic conditions)	Annual changes in temperature, illumination and watering. During the hibernation period night temperatures should be between 12 and 8 °C and day temperatures between 12 and 16 °C. An UV-radiation spot with temperatures between 25 and 30 °C should be provided. Daily water spraying during summer and every second day during hibernation is needed. It is not possible to keep several males together due to their aggressive behavior, especially during the mating season. It is recommended to generelly keep individuals separately and only keep pairs together during the mating season
Keeping difficulty	Not difficult if the above mentioned conditions are ensured. A rich diet with a variety of insects supplemented with minerals and vitamins, especially for the juveniles, is important
General characteristics, difficulties with keeping and breeding	During frost-free season, individuals should be kept in vegetation rich, outdoor mesh terrariums with a minimum size of 60 x 60 x 80 cm (L x W x H). This is mandatory for all *Abronia* species. During wintertime, these enclosures should be placed in a temperate cool, but frost-protected room indoors. An UV-Spot with max. temperatures of 25-30 °C under the spot at day and nighttime cooling to temperatures below 10 °C is necessary while keeping indoors. Juveniles are kept and handled similar to adults. Due to the potential aggressive behavior, it is not recommended to keep more than three juveniles together. As soon as freezing temperatures are not expectable any more, the enclosures should be placed outdoors. Keeping of the species is only recommended for advanced and experienced keepers. Indoors keeping through the whole year is not appropriate. Typical lizard diseases such as worms and protozoans, can occur in these arboreal alligator lizards. High parasite infestation is sign of a potential illegal wild catch. Captive bred generations should be minimally infested or completely parasite free. Infestation with the snake mite Ophionyssus natricis can rapidly end fatal and should therefore be immediately treated. Frontline® has been proven to be an appropriate treatment
Number of evaluated questionnaires/interviewed persons (institution/private/scientists/commercial breeder)	2

The species is kept in captivity mostly in the USA and occasionally in Europe since 2003.

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Autor: Christian Langner **27.07.2019**

Abronia bogerti TIHEN, 1954

Bogert's Arboreal Alligator Lizard

German: Bogerts Baumschleiche

Spanish: Escorpión Arborícola de Bogert

Abronia bogerti Photo Credit: Peter Heimes

Morphology

Snout-vent length 94 mm.

The dorsal ground color of the holotype is described as greenish but the ground color of following specimens found were cream and yellowish. It has 10 to 11 brown crossbands across the dorsal. The venter is homogeneous in color but sometimes shows a faint line made of pigmented scales between the rows of scales.

Abronia bogerti is one of the three species belonging to the subgenus *Scopaeabronia* (CAMPBELL & FROST 1993). All three species of this subgenus, *A. bogerti, A. chiszari* and *A. ramirezi,* have an elongated body and 10 to 11 dark crossbands and have a relative short body size as indicated by the name of the subgenus (skoppaios, dwarf) (CAMPBELL & FROST 1993). A further characteristic of the species belonging to *Scopaeabronia* is that they occur at relative low altitudes for an *Abronia*, between 650 and 1500 m asl (CLAUSE *et al.* 2016).

Geographic distribution, Habitat

East of Oaxaca, border to Chiapas, Mexico. Up to date only known from Cerro Baul mountain rain forests and low cloud forests at 760 - 1500 m asl. Type locality: Sierra Atravesada, north from Niltepec, between Cerro Atravesada and Sierra Madre, Oaxaca, Mexico.

Conservation status and main threats

CITES Annex II since 2016 (CoP17 Proposal 26).

EU Regulation 2017/160 [EG] Annex: B.

In Germany strictly and particularly protected under BNatSchG [BG] Status: b.

IUCN-Red List status: DD - Data Deficient (assessed 1 March 2007).

The main threat for all arboreal alligator lizards is the massive habitat destruction. Cloud forests of Central America are one of the most endangered habitats worldwide. Illegal collection for the pet trade and hunting by rural people pose further threats. Arboreal alligator lizards are thought to be highly venomous and killed when seen.

Reproduction

Unknown.

Husbandry and captive breeding X

No data on keeping available/ no keeping of the species is known.

References

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Author: Christian Langner **15.08.2019**

Abronia campbelli BRODIE & SAVAGE, 1993

Campbell's Alligator Lizard
German: Campbells Baumschleiche

Abronia campbelli Photo Credit: Christian Langner

Morphology

Snout-vent length up to 127 mm.

The dorsal ground color is grey-brown with a yellow or yellow-green sheen. It has irregular dark dots and bands on the dorsum of the body and tail. It has a pale yellow ring around the eye. The supra-auricular scales and the venter are cream.

Abronia campbelli belongs to the subgenus *Auriculabronia.*

Geographic distribution, Habitat

Abronia campbelli occurs east of Guatemala and up to date is only known from the Terra typica. It inhabits the isolated remnants of what it was an oak forest on an extinct volcano. *Abronia campbelli* live on oak trees heavily covered with epiphytes such as *Tilandsia usneoides*, which is their main microhabitat. Campbell's Alligator Lizard habitat is the driest of all arboreal alligator lizards.

Type locality: Cerro Tablón de las Minas near La Pastoría, Jalapa, Guatemala.

Conservation status and main threats

CITES Appendix I since 2016 (CoP17 Proposal 25).

EU Regulation 2017/160 [EG] Annex: B.

In Germany strictly and particularly protected under BNatSchG [BG] Status: b.

IUCN- Red List status: CR – Critically Endangered B1ab(iii) (assessed 6 May 2012).

The main threat for all arboreal alligator lizards is the massive habitat destruction. Cloud forests of Central America are one of the most endangered habitats worldwide. Illegal collection for the pet trade and hunting from rural people pose further threats. Arboreal alligator lizards are thought to be highly venomous and killed when seen.

The Critically Endangered *Abronia campbelli* was thought to be extinct until it was found in 2010 again. The remaining habitat should be protected and an *ex situ* breeding program is urgently needed.

Reproduction

Secondary sexual traits	♀♀ more slender than ♂♂; head of ♂♂ wider and more prominent
Sexual maturity	With 2 - 3 years
Reproduction	Viviparous
Mating season	End of summer / autumn. The copula can take several hours and even days
Birth season	May
Litter size (Min. – Max.)	4 - 6
Gestation period	Ca. 8 months
F2 Generation bred	Yes
Offspring size / weight	4 cm
Sperm storage	Unknown

Husbandry and captive breeding

Trigger for reproduction (e.g. technical equipment, care, social and climatic conditions)	Annual changes in temperature, illumination and watering. During the hibernation period, night temperatures should be between 12 and 8 °C, and day temperatures between 12 and 16 °C. An UV-radiation spot with temperatures between 25 and 30 °C should be provided. Daily water spraying during summer and every second day during hibernation is needed. It is not possible to keep several males together due to their aggressive behavior, especially during the mating season. It is recommended to keep animals separately and only during the mating season together

Keeping difficulty	Not difficult if the above mentioned conditions are ensured. A rich diet with a variety of insects supplemented with minerals and vitamins, especially for the juveniles, is important
General characteristics, difficulties with keeping and breeding	During frost free season should be kept in vegetation rich, outdoor mesh terrariums with a minimum size of 60 x 60 x 80 cm (L x W x H). For all *Abronia* species the keeping outdoors in mesh terrarium during the frost-free season and in a cool, frost-free terrarium with daily UV-Spot place during hibernation is mandatory. Juveniles are kept and handled similar to adults. Due to the potential aggressive behavior, is not recommended to keep more than three juveniles together. As soon as outdoor temperatures are good, animals should be kept outdoors. Husbandry is only recommended for advanced keepers. Indoor keeping through the whole year is not appropriate. Typical lizard diseases such as worms and protozoans, can occur in these arboreal alligator lizards. High parasite infestation is sign of a potential illegal wild catch. New bred generations should be minimally infested or completely parasite free. Infestation with the snake mite *Ophionyssus natricis* can rapidly end fatal and should therefore be immediately treated. Frontline® has been proven to be an appropriate treatment
Number of evaluated questionnaires	3

Abronia campbelli is rarely kept and bred in Europe and USA.

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Author: Christian Langner **27.07.2019**

Abronia chiszari SMITH & SMITH, 1981

Chiszar's Arboreal Alligator Lizard

German: Chiszars Baumschleiche

Spanisch: Escorpión Arborícola de Chiszar

Abronia chiszari Photo Credit: Peter Heimes

Morphology

Snout-vent length 147 mm.

The holotype, a subadult female, is 40.5 mm SVL. The dorsal crossbands are dark brown. The dark areas are 3 scales wide, and are interrupted by one and a half row of scales of bright color. The venter is cream white and the head is dark brown. Two specimens were found in 2002 which helped to describe the color in life. Yellow flecking on the head and body was described in those two specimens. The iris is yellow.

Abronia chiszari is one of the three species belonging to the subgenus *Scopaeabronia* (CAMPBELL & FROST 1993). All three species of this subgenus, *A. bogerti, A. chiszari* and *A. ramirezi,* have an elongated body and 10 to 11 dark crossbands and have a relative short body as indicated by the name of the subgenus (skoppaios, dwarf) (CAMPBELL & FROST 1993). A further characteristic of the species belonging to *Scopaeabronia* is that they occur at relative low altitudes for an *Abronia*, between 650 and 1500 m asl (CLAUSE *et al.* 2016).

Geographic distribution, Habitat

Only known in the surroundings of Catemaco by the volcano Santa Marta, in Sierra de los Tuxtlas, Veracruz, Mexico, between 360 to 800 m asl.

Type locality: 2.5 Miles east of Cuetzalapan, Veracruz, Mexico at 360 m asl. CAMPBELL (1982) doubts that this is the exact origin, because the specimen was found on a bumper of a vehicle and could have come from a higher location.

Conservation status and main threats

CITES Annex II since 2016 (CoP17 Proposal 26).

EU Regulation 2017/160 [EG] Annex: B.

In Germany strictly and particularly protected under BNatSchG [BG] Status: b.

IUCN-Red List status: EN – Endangered B1ab(iii) (assessed 1 March 2007).

The main threat for all arboreal alligator lizards is the massive habitat destruction. Cloud forests of Central America are one of the most endangered habitats worldwide. Illegal collection for the pet trade and hunting by rural people pose further threats. Arboreal alligator lizards are thought to be highly venomous and killed when seen.

Reproduction

Unknown.

Husbandry and captive breeding X

No data on keeping available/ no keeping of the species is known.

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SMITH, H.M & R.B. SMITH (1981): Another epiphytic alligator lizard (*Abronia*) from Mexico. Bulletin of the Maryland Herpetological Society **17**(2): 51-60.

Author: Christian Langner **15.08.2019**

Abronia cuetzpali Campbell, Solano-Zalaveta, Flores-Villela, Caviedes-Solis & Frost, 2016

Cuetzpal's Arboreal Alligator Lizard

German: Cuetzpals Baumschleiche

Spanisch: Escorpión Arborícola de Cuetzpal

Abronia cuetzpali Photo Credit: Israel Solano

Morphology

Snout-vent length up to 115 mm.

The ground color of the dorsum is brown with seven crossbands heavily flecked with black. Some of the head scales are green-yellow. The venter is white. The iris is white with a slight yellowish-green sheen up to silver-white. The snout is grey with 15 slightly irregular blacked flecked crossbands. Within the subgenus *Abronia*, it belongs to the *Abronia deppii* group.

Geographic distribution, Habitat

Up to date, only known from Sierra Madre del Sur, Oaxaca de Santa Catarina Juquila to San Miguel Suchixtepec. At elevations between 1711 - 2150 m asl in pine-oak mixed forests.

Type locality: Near San Miguel Suchixtepec, Sierra de MiahuatlEan, ca. 2 km west from Rio Molino, Sierra Madre del Sur, Oaxaca, Mexico, at 2150 m asl (16.08439°N, 96.49042°W).

Conservation status and main threats

CITES Annex II since 2016 (CoP17 Proposal 26).

EU Regulation 2017/160 [EG] Annex: B.

In Germany strictly and particularly protected under BNatSchG [BG] Status: b.

IUCN – Red List status: No classification available.

The main threat for all arboreal alligator lizards is the massive habitat destruction. Cloud forests of Central America are one of the most endangered habitats worldwide. Illegal collection for the pet trade and hunting by rural people pose further threats. Arboreal alligator lizards are thought to be highly venomous and killed when seen.

Reproduction

Unknown.

Husbandry and captive breeding X

No keeping known.

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Author: Christian Langner **13.08.2019**

Abronia deppii (WIEGMANN, 1828)

Deppe's Arboreal Alligator Lizard
German: Deppes Baumschleiche
Spanisch: Escorpión Arborícola de Deppe

Abronia deppii Photo Credit: Christian Langner

Morphology

Snout-vent length up to 115 mm.

The dorsal ground color is black and white, rarely brown flecked. Strong sexual dichromatism. The venter of males is bright orange-red, especially during the mating season. Some dorsal scales can also be orange. The venter of females is cream. Juveniles have accentuated white and black crossbands. A specimen with grey head is known from Michoacán.

Geographic distribution, Habitat

North of Guerrero, Department in Mexico, north Morelos, Michoacán. Oak-pine mixed forests and cloud forest up to 2450 m asl.

Conservation status and main threats

CITES Appendix II since 2016 (CoP17 Proposal 26).

EU Regulation 2017/160 [EG]: Annex: B.

In Germany strictly and particularly protected under BNatSchG [BG] Status: b.

IUCN- Red List status: EN – Endangered B1ab(iii) (assessed 01 March 2007).

The main threat for all arboreal alligator lizards is the massive habitat destruction. Cloud forests of Central America are one of the most endangered habitats worldwide. Illegal collection for the pet trade and hunting by rural people pose further threats. Arboreal alligator lizards are thought to be highly venomous and killed when seen.

Reproduction

Secondary sexual traits	♀♀ more slender than ♂♂; head of ♂♂ wider and more prominent; sexual dichromatism (see above)
Sexual maturity	After ca. 2 years of age
Reproduction	Viviparous. The copula can take several hours and even days
Mating season	End of summer / autumn
Birth season	March / April
Litter size (Min. – Max.)	2 - 8
Gestation period	6 - 8 months
F2 Generation bred	Yes
Offspring size / weight	3 cm / 1 g
Mortality	Fluctuating, between 0 % und 100 %
Sperm storage	Unknown

Husbandry and captive breeding

Trigger for reproduction (e.g. technical equipment, care, social and climatic conditions)	Annual changes in temperature, illumination and watering. During the hibernation period night temperatures should be between 12 and 8 °C and day temperatures between 12 and 16 °C. An UV-radiation spot with temperatures between 25 and 30 °C should be provided. Daily water spraying during summer and every second day during hibernation is needed. It is not possible to keep several males together due to their aggressive behavior, especially during the mating season. 1.1 or small groups of 1.2 are preferable and can easily kept together year-round
Keeping difficulty	Not difficult if the above mentioned conditions are ensured. A rich diet with a variety of insects supplemented with minerals and vitamins, especially for the juveniles, is important
General characteristics, difficulties with keeping and breeding	During frost-free season, individuals should be kept in vegetation rich, outdoor mesh terrariums with a minimum size of 60 x 60 x 80 cm (L x W x H). This is mandatory for all *Abronia* species. During wintertime, these enclosures should be placed in a temperate cool but frost-protected room indoors. An UV-spot with max. temperatures of 25 - 30 °C

	under the spot at day and nighttime cooling to temperatures below 10 °C is necessary while keeping indoors. Juveniles are kept and handled similar to adults. Due to the potential aggressive behavior, it is not recommended to keep more than three juveniles together. As soon as freezing temperatures are not expectable any more, the enclosures should be placed outdoors. Keeping of the species is only recommended for advanced and experienced keepers. Indoor keeping through the whole year is not appropriate. Typical lizard diseases such as worms and protozoans, can occur in these arboreal alligator lizards. High parasite infestation is sign of a potential illegal wild catch. Captive bred generations should be minimally infested or completely parasite free. Infestation with the snake mite *Ophionyssus natricis* can rapidly end fatal and should therefore be immediately treated. Frontline® has been proven to be an appropriate treatment
Number of evaluated questionnaires/interviewed persons (institution/private/scientists/commercial breeder)	6 (private)

The species is kept and bred in Europe and USA.

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Author: Christian Langner **27.07.2019**

Abronia fimbriata (COPE, 1885)

Fimbriated Arboreal Alligator Lizard

German: Fransen-Baumschleiche

Spanish: Dragoncito de Guatemala central

Abronia fimbriata Foto: Vojtěch Víta

Morphology

Snout-vent length up to 130 mm.

The dorsum ground color is brown-grey. The venter of the body is cream-white. The head is steel-grey. The spinelike supra-auriculars are white. The venter of the body is cream-colored. The sublabial scales are orange. Juveniles are brown with a usually discontinuous dark brown line along the backbone. This species belongs to the subgenus *Auriculabronia* due to their pronounced supra-auricular scales (CAMPBELL & FROST 1993).

Geographic distribution, Habitat

Northeast highlands of Guatemala; found in cloud forests west from Sierra de las Minas, Department Baja Verapaz, between 1500 and 2100 m asl and in Sierra de Xucaneb (Montaña Ulpán), Department of Alta Verapaz, between 1400 m and 2000 m. Both localities are situated in the region around Quecchian and Sierra de las Minas, CAMPBELL & VANNINI (1989).

Type locality: surroundings of Cáquipec, Alta Verapaz, Guatemala.

Conservation status and main threats

CITES Appendix I since 2016 (CoP17 Proposal 25).

EU Regulation 2017/160 [EG]: Annex: A.

In Germany strictly and particularly protected under BNatSchG [BG] Status: s.

IUCN- Red List status: EN - Endangered B1ab(iii) (assessed 6 May 2012).

The main threat for all arboreal alligator lizards is the massive habitat destruction. Cloud forests of Central America are one of the most endangered habitats worldwide. Illegal collection for the pet trade and hunting by rural people pose further threats. Arboreal alligator lizards are thought to be highly venomous and killed when seen.

Reproduction

Secondary sexual traits	♀♀ more slender than ♂♂; head of ♂♂ wider and more prominent
Sexual maturity	At or after ca. 2 years of age
Reproduction	Viviparous
Mating season	Unknown
Birth season	October
Litter size (Min. – Max.)	8
Gestation period	13.5 months
F2 Generation bred	No
Offspring size / weight	–
Mortality	–
Sperm storage	Unknown

Husbandry and captive breeding

Trigger for reproduction (e.g. technical equipment, care, social and climatic conditions)	Annual changes in temperature, illumination and watering. During the hibernation period night temperatures should be between 12 and 8 °C, and day temperatures between 12 and 16 °C. An UV-radiation spot with temperatures between 25 and 30 °C should be provided. Daily water spraying during summer and every second day during hibernation is needed. It is not possible to keep several males together due to their aggressive behavior, especially during the mating season. 1.1 or small groups of 1.2 are preferable and can easily kept together year-round
Keeping difficulty	Not difficult if the above mentioned conditions are ensured. A rich diet with a variety of insects supplemented with minerals and vitamins, especially for the juveniles, is important

General characteristics, difficulties with keeping and breeding	During frost-free season, individuals should be kept in vegetation rich, outdoor mesh terrariums with a minimum size of 60 x 60 x 80 cm (L x W x H). This is mandatory for all *Abronia* species. During wintertime, these enclosures should be placed in a temperate cool but frost-protected room indoors. An UV-Spot with max. temperatures of 25 - 30 °C under the spot at day and nighttime cooling to temperatures below 10 °C is necessary while keeping indoors. Juveniles are kept and handled similar to adults. Due to the potential aggressive behavior, it is not recommended to keep more than three juveniles together. As soon as freezing temperatures are not expectable any more, the enclosures should be placed outdoors. Keeping of the species is only recommended for advanced and experienced keepers. Indoor keeping through the whole year is not appropriate. Typical lizard diseases such as worms and protozoans, can occur in these arboreal alligator lizards. High parasite infestation is sign of a potential illegal wild catch. Captive bred generations should be minimally infested or completely parasite free. Infestation with the snake mite *Ophionyssus natricis* can rapidly end fatal and should therefore be immediately treated. Frontline® has been proven to be an appropriate treatment
Number of evaluated questionnaires/interviewed persons (institution/private/scientists/commercial breeder)	1 (private)

Very few individuals are kept and bred in Europe and USA.

References

ACEVEDO, M., D. ARIANO-SÁNCHEZ & J. JOHNSON (2014): *Abronia fimbriata*. The IUCN Red List of Threatened Species 2014: e.T203015A2758590.

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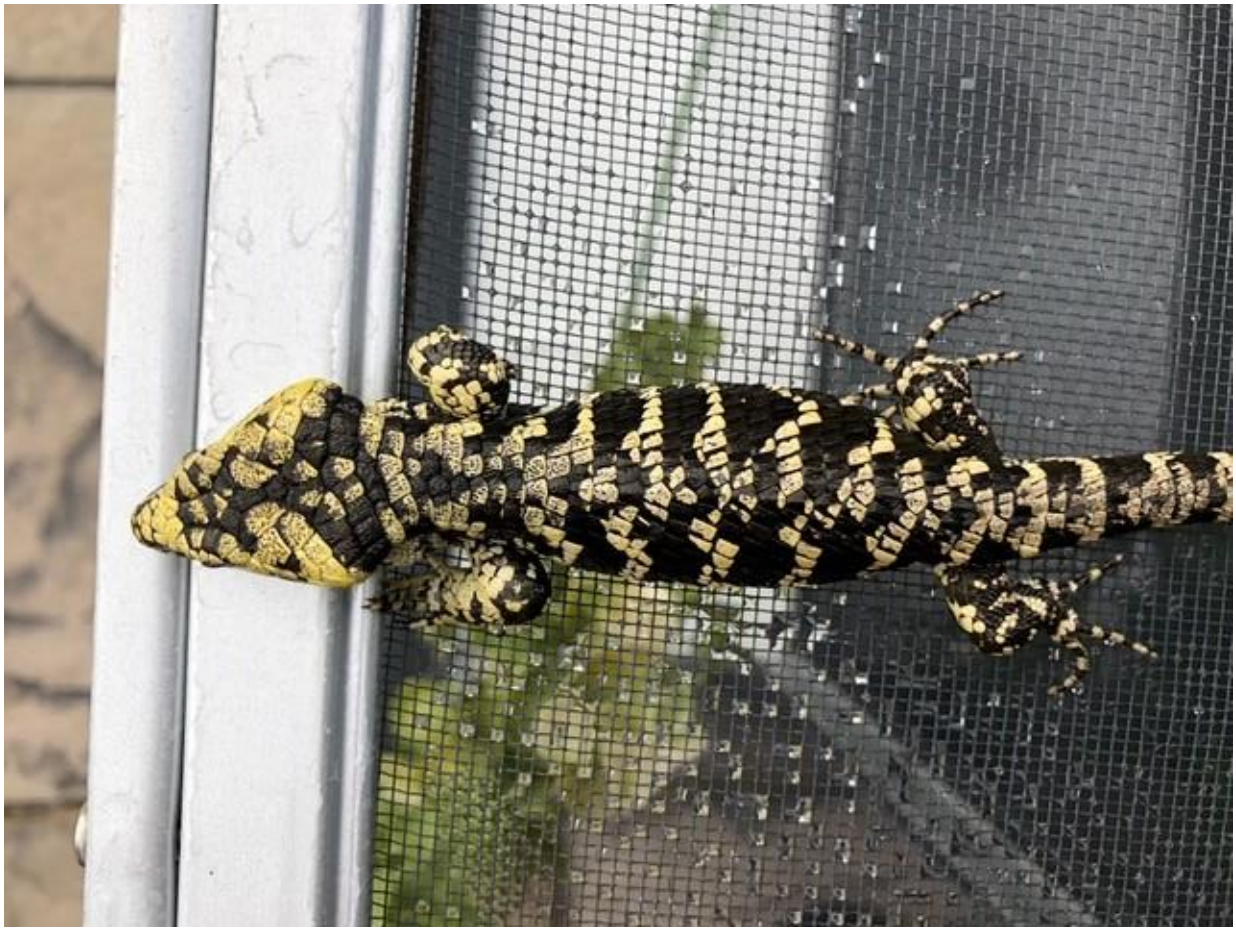
Author: Christian Langner **27.07.2019**

Abronia frosti CAMPBELL, SASA, ACEDO & MENDELSON, 1998

Frost's Arboreal Alligator Lizard

Spanish: Escorpión Arborícola de Frost

German: Frosts Baumschleiche



Abronia frosti Photo credit: Anonymus/Archive Langner

Morphology

Snout-vent length up to 101 mm.

The dorsal ground color is black with 7-8 white or yellow crossbands. The dorsal crossbands can be formed either as a single band or as a row of dots which sometimes can be strongly reduced. These crossbands sometimes extend to the dorsum of the tail. The gular region is whitish. The venter of the body is black or dark brown. *Abronia frosti* is the only arboreal alligator lizard of Guatemala without spinelike supra-auricular scales.

Geographic distribution, Habitat

Northwest of Guatemala (Sierra de los Cuchumatanes), in 2835 m asl. Mountainous rainforest with hardwood trees up to 30 m high.

Type locality: Along road to Patalcal, 5.9 km (by road) Northwest national highway 9N near San Mateo Ixtatán, Guatemala in 2835 m.

Conservation status and main threats

CITES Appendix I since 2016 (CoP17 Proposal 25).

EU Regulation 2017/160 [EG]: Annex: A.

In Germany strictly and particularly protected under BNatSchG [BG] Status: s.

IUCN-Red List status: CR - Critically Endangered B1ab(iii) (assessed 6 March 2012).

The main threat for all arboreal alligator lizards is the massive habitat destruction. Cloud forests of Central America are one of the most endangered habitats worldwide. Illegal collection for the pet trade and hunting from rural people pose further threats. Arboreal alligator lizards are thought to be highly venomous and killed when seen.

Reproduction

Nothing is known.

Husbandry and captive breeding X

Occasionally kept and bred in USA. More precise information is not available.

References

ARIANO-SÁNCHEZ, D., M. ACEVEDO & J. JOHNSON (2013): *Abronia frosti*. The IUCN Red List of Threatened Species 2013: e.T29479A2790394.

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LANGNER, C. (2014): Baumschleichen der Gattung *Abronia*. Terraria-Elaphe **2014**(1): 14-26.

Author: Christian Langner **27.07.2019**

Abronia fuscolabialis (TIHEN, 1944)

Mount Zempoaltepec Arboreal Alligator Lizard

Spanish: Escorpión Arborícola del Zempoaltepec

German: Mount-Zempoaltepec-Baumschleiche

Abronia fuscolabialis Photo Credit: Peter Heimes

Morphology

Snout-vent length up to 118 mm.

One of the most colorful arboreal alligator lizards. Blue, yellow, black, white and green-yellow are irregularly present in the dorsum.

It belongs to the nominate subgenus *Abronia*.

Geographic distribution, Habitat

Oaxaca, Mexico.

Type locality: Mount Zempoaltepec, Oaxaca, Mexico.

Conservation status and main threats

CITES Appendix II since 2016 (CoP17 Proposal 26).

EU Regulation 2017/160 [EG] Annex: B.

In Germany strictly and particularly protected under BNatSchG [BG] Status: b.

IUCN- Red List status: EN (Endangered B1ab(iii) – assessed 01 March 2007).

The main threat for all arboreal alligator lizards is the massive habitat destruction. Cloud forests of Central America are one of the most endangered habitats worldwide. Illegal collection for the pet trade and hunting by rural people pose further threats. Arboreal alligator lizards are thought to be highly venomous and killed when seen.

Reproduction

To date unknown.

Husbandry and captive breeding X

No data on keeping or breeding are available.

References

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Author: Christian Langner

27.07.2019

Abronia gaiophantasma CAMPBELL & FROST, 1993

Brilliant Arboreal Alligator Lizard

Spanish: Dragoncito de la Sierra de las Minas

German: Erdgeist-Baumschleiche

No photo available

Morphology

Snout-vent length up to 110 mm.

The dorsum ground color is red- brown or pale grey-brown. It has 7 to 9 dark brown crossbands in the dorsum, which can extend to the tail. The crossbands tend to disappear in adults. The venter of the head and neck is white. The venter of the body is blue-grey. The spinelike supra-auricular scales classify *A. gaiophantasma* in the subgenus *Auriculabronia* (CAMPBELL & FROST 1993).

Geographic distribution, Habitat

Northeast Guatemala (Sierra de los Cuchumatanes), in 600 - 2350 m asl. Two specimens were found in the surroundings of Chikaknab, 23 km east from Cobán, Sierra de Yalijux, Alta Verapaz, Guatemala (FRANZEN & HAFT 1999). Pine and cloud forest. Is sympatric to *Abronia fimbriata* in Sierra de las Minas.

Type locality: cloud forest at 1600 m asl at the west slopes of Cerro Verde in the vicinity of La Unión Barrios, Baja Verapaz, Guatemala (approximately 15°11' N, 90° 12' W).

Conservation status and main threats

CITES Appendix II since 2016 (CoP17 Proposal 25).

EU Regulation 2017/160 [EG]: Annex: B.

In Germany strictly and particularly protected under BNatSchG [BG] Status: b.

IUCN- Red List status: EN - Endangered B1ab(iii) (assessed 6 March 2012).

The main threat for all arboreal alligator lizards is the massive habitat destruction. Cloud forests of Central America are one of the most endangered habitats worldwide. Illegal collection for the pet trade and harassment by rural people pose further threats. Arboreal alligator lizards are thought to be highly poisonous and killed when seen.

Reproduction

No data available.

Husbandry and captive breeding X

No data are available on keeping or breeding.

References

ARIANO-SÁNCHEZ, D. & L. MELENDEZ (2014): Baumschleichen der Gattung *Abronia* in Guatemala. Terraria-Elaphe **2014**(3): 44-48.

ARIANO-SÁNCHEZ, D., M. ACEVEDO & J. JOHNSON (2014): *Abronia gaiophantasma*. The IUCN Red List of Threatened Species 2014: e.T203016A2758597.

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Author: Christian Langner **13.08.2019**

Abronia graminea (COPE, 1864)

Sierra de Tehuacan Arboreal Alligator Lizard
Spanish: Escorpión Arborícola de Tehuacá
German: Grüne Baumschleiche

Abronia graminea Photo Credit: Christian Langner

Morphology

Snout-vent length: 125 mm; total length: 305 mm.

The ground color is very variable but predominantly green. These green arboreal alligator lizards are able to physiologically change their ground color to a certain extent. The coloration is temperature and stimuli dependent. Animals can turn from bright green to olive or dark green. Contrary to chameleons, the change in coloration takes longer. If specimens are exposed to cooler conditions for a longer period, their ground color typically darkens, which is thought to be an adaptation of thermoregulation.

The ground color of wild individuals is bright green. The venter is yellow. A yellow colored ring is present around the eyes. Noticeable is the tendency to become more turquoise bluish in captivity.

Abronia graminea shows sexual dichromatism. Whereas males are always green or turquoise, females can also show different shades of grey to brown-green flecking or even have crossbands. The juveniles differ from adults in their ground color and are flecked brown and black with a ground color from bright to beige brown. The color change occurs with 6 to 9 months.

Geographic distribution, Habitat

Abronia graminea occurs in Central Veracruz, East-Puebla and Oaxaca, Mexico.

Type locality: Orizaba, Mexico.

Conservation status and main threats

CITES Appendix II since 2016 (CoP17 Proposal 26).

EU Regulation 2017/160 [EG] Annex: B.

In Germany strictly and particularly protected under BNatSchG [BG] Status: b.

IUCN- Red List status: EN - Endangered B1ab(iii) (assessed 1 March 2007).

The main threat for all arboreal alligator lizards is the massive habitat destruction. Cloud forests of Central America are one of the most endangered habitats worldwide. Illegal collection for the pet trade and hunting by rural people pose further threats. Arboreal alligator lizards are thought to be highly venomous and killed when seen.

Reproduction

Secondary sexual traits	♀♀ more slender than ♂♂; head of ♂♂ wider and more prominent
Sexual maturity	With 2 - 3 years, 17 - 20 cm TL
Reproduction	Viviparous
Mating season	Late summer/ autumn; the copula can take several hours and even days
Birth season	March / April
Litter size (Min. – Max.)	2 - 12
Gestation period	7 - 9 months
F2 Generation bred	Up to F3 generations have been bred in captivity
Offspring size / weight	SVL 44 mm; TL 108 mm
Sperm storage	Unknown

Husbandry and captive breeding

Trigger for reproduction (e.g. technical equipment, care, social and climatic conditions)	Annual changes in temperature, illumination and watering. During the hibernation period, night temperatures should be between 12 and 8 °C, and day temperatures between 12 and 16 °C. An UV-radiation spot with temperatures between 25 - 30 °C should be provided. Daily water spraying during summer and every second day during hibernation is needed. It is not possible to keep several males together due to their aggressive behavior, especially during the mating season. 1.1 or small groups of 1.2 are preferable and can easily kept together year-round
Keeping difficulty	Not difficult if the above mentioned conditions are ensured. A rich diet with a variety of insects supplemented with minerals and vitamins, especially for the juveniles, is important
General characteristics, difficulties with keeping and breeding	During frost-free season, individuals should be kept in vegetation rich, outdoor mesh terrariums with a minimum size of 60 x 60 x 80 cm (L x W x H). This is mandatory for all *Abronia* species. During wintertime, these enclosures should be placed in a temperate cool but frost-protected room indoors. An UV-spot with max. temperatures of 25 -30 °C under the spot at day and nighttime cooling to temperatures below 10 °C is necessary while keeping indoors. Juveniles are kept and handled similar to adults. Due to the potential aggressive behavior, it is not recommended to keep more than three juveniles together. As soon as freezing temperatures are not expectable any more, the enclosures should be placed outdoors. Keeping of the species is only recommended for advanced and experienced keepers. Indoor keeping through the whole year is not appropriate. Typical lizard diseases such as worms and protozoans, can occur in these arboreal alligator lizards. High parasite infestation is sign of a potential illegal wild catch. Captive bred generations should be minimally infested or completely parasite free. Infestation with the snake mite *Ophionyssus natricis* can rapidly end fatal and should therefore be immediately treated. Frontline® has been proven to be an appropriate treatment
Number of evaluated questionnaires/interviewed persons (institution/private/scientists/commercial breeder)	6 (private) 1 (institution)

Abronia graminea is regulary kept and bred in Europe and USA.

References

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Author: Christian Langner **27.07.2019**

Abronia leurolepis CAMPBELL & FROST, 1993

Flat-scaled Arboreal Alligator Lizard, Smoothback arboreal alligator lizard

Spanish: Escorpión Arborícola de Escamas Planas

German: Flachrückenbaumschleiche

No photo available

Morphology

Snout-vent length up to 105 mm.

The dorsal ground color is olive-grey with irregular crossbands. The tail has round dark dots along the middle. The venter is pale with dark colors on the edge of the scales. The spinelike supra-auricular scales classify it into the subgenus *Auriculabronia* (CAMPBELL & FROST 1993).

Geographic distribution, Habitat

East Chiapas, Mexico. Cloud forest.

Type locality: Santa Rosa, near Comitán, E Chiapas, Mexico (1800 - 2300 m).

Conservation status and main threats

CITES Appendix II since 2016 (CoP17 Proposal 26).

EU Regulation 2017/160 [EG]: Annex: B.

In Germany strictly and particularly protected under BNatSchG [BG] Status: b.

IUCN-Red List status: DD (Data Deficient – assessed 01 March 2007).

The main threat for all arboreal alligator lizards is the massive habitat destruction. Cloud forests of Central America are one of the most endangered habitats worldwide. Illegal collection for the pet trade and harassment by rural people pose further threats. Arboreal alligator lizards are thought to be highly venomous and killed when seen.

Reproduction

Up to date unknown.

Husbandry and captive breeding X

No data on keeping or breeding are available.

References

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LANGNER, C. (2014): Baumschleichen der Gattung *Abronia*. Terraria-Elaphe **2014**(1): 14-26.

Author: Christian Langner **13.08.2019**

Abronia lythrochila SMITH & ALVAREZ DEL TORO, 1963

Red-lipped Arboreal Alligator Lizard

Spanish: Escorpión Arborícola de Labios Rojos

German: Rotlippenbaumschleiche

Abronia lythrochila Photo Credit: Christian Langner

Morphology

Snout-vent length up to 138 mm.

The dorsal ground color can vary from completely grey, predominantly beige brown, mottled black and white or yellow and white, as well as bright red to rust red in different color combinations. The sub-labial scales are bright orange-red, which is characteristic of this species. As one representative of the genus *Auriculabronia* it has the distinctive spinelike supra-auricular scales.

Geographic distribution, Habitat

Chiapas, Mexico. According to TORRES *et al.* (2013) *Abronia lythrochila* also occurs in Guatemala. Oak-pine mixed forest at 2000 - 3000 m.

Type locality: Nachij, road from Tuxtla to Las Casas, Chiapas, Mexico.

Conservation status and main threats

CITES Appendix II since 2016 (CoP17 Proposal 26).

EU Regulation 2017/160 [EG]: Annex: B.

In Germany strictly and particularly protected under BNatSchG [BG] Status: s.

IUCN- Red List status: LC – Least Concern (assessed 01 March 2007).

The main threat for all arboreal alligator lizards is the massive habitat destruction. Cloud forests of Central America are one of the most endangered habitats worldwide. Illegal collection for the pet trade and hunting by rural people pose further threats. Arboreal alligator lizards are thought to be highly venomous and killed when seen.

Reproduction

Secondary sexual traits	♀♀ more slender than ♂♂; head of ♂♂ wider and more prominent; ♂♂ usually more colorful
Sexual maturity	With 2 years, at 17 - 20 cm total length
Reproduction	Viviparous
Mating season	Late summer/ autumn; copula can take up to 41 hours
Birth season	March / April
Litter size (Min. – Max.)	10 - 16
Gestation period	6 - 8 months
F2 Generation bred	Yes
Offspring size / weight	3 cm / 1 g
Sperm storage	Unknown
Mortality	Highly fluctuating, between 0 % and 100 %
% of offspring that achieve maturity	Highly fluctuating, between 0 % and 100 %. Fatalities are often reported for this species but no reason has been identified yet

Husbandry and captive breeding 

Trigger for reproduction (e.g. technical equipment, care, social and climatic conditions)	Annual changes in temperature, illumination and watering. During the hibernation period, night temperatures should be between 12 and 8 °C and day temperatures between 12 and 16 °C. An UV-radiation spot with temperatures between 25 and 30 °C should be provided. Daily water spraying during summer and every second day during hibernation is needed. It is not possible to keep several males together due to their aggressive behavior, especially during the mating season. 1.1 or small groups of 1.2 are preferable and can easily kept together year-round

Keeping difficulty	Not difficult if the above mentioned conditions are ensured. A rich diet with a variety of insects supplemented with minerals and vitamins, especially for the juveniles, is important
General characteristics, difficulties with keeping and breeding	During frost-free season, individuals should be kept in vegetation rich, outdoor mesh terrariums with a minimum size of 60 x 60 x 80 cm (L x W x H). This is mandatory for all *Abronia* species. During wintertime, these enclosures should be placed in a temperate cool but frost-protected room indoors. An UV-Spot with max. temperatures of 25 - 30 °C under the spot at day and nighttime cooling to temperatures below 10 °C is necessary while keeping indoors. Juveniles are kept and handled similar to adults. Due to the potential aggressive behavior, it is not recommended to keep more than three juveniles together. As soon as freezing temperatures are not expectable any more, the enclosures should be placed outdoors. Keeping of the species is only recommended for advanced and experienced keepers. Indoors keeping through the whole year is not appropriate. Typical lizard diseases such as worms and protozoans, can occur in these arboreal alligator lizards. High parasite infestation is sign of a potential illegal wild catch. Captive bred generations should be minimally infested or completely parasite free. Infestation with the snake mite *Ophionyssus natricis* can rapidly end fatal and should therefore be immediately treated. Frontline® has been proven to be an appropriate treatment
Number of evaluated questionnaires/interviewed persons (institution/private/scientists/commercial breeder)	5 (private)

Abronia lythrochila is regularly kept and bred in Europe and USA.

References

ACEVEDO, M., L.D. WILSON, E.B. CANO & C. VÁSQUEZ-ALMAZÁN (2010): Diversity and conservation status of the Guatemalan Herpetofauna. Pg. 406–435. In: Wilson, L.D., J.H. Townsend & J.D. Johnson (Eds.): Conservation of Mesoamerican Amphibians and Reptiles. Eagle Mountain, Utah (Eagle Mountain Publishing LC.).

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Author: Christian Langner **29.07.2019**

Abronia martindelcampoi FLORES-VILLELA & SANCHEZ 2003

Martín del Campo's Arboreal Alligator Lizard

German: Martin del Campos Baumschleiche

Spanisch: Escorpión Arboricola de Martin del Campo

Abronia martindelcampoi Photo credit: Christian Langner

Morphology

Snout-vent length: 115 cm.

The coloration of head and body is light grey to cream-white. Black dots or irregular bands spread over the body. Egg-yolk to orange colored dots appear mainly in the upper parts of dorsal scales. Even the labial-scales cloud be bright orange colored. The ventral side is cream white.

Abronia martindelcampoi is a member of the subgenus *Abronia*. The viper *Ophryacus undulates* is known as a predator.

Geographic distribution, Habitat

Abronia martindelcampoi is known from the Mexican state Guerrero. The habitat is pine-oak forest.

Type Locality: Chilpancingo, Omiltemi, Orilla Norte, Guerrero, Mexico, in oak-forrest in 2250 m a.s.l.

Conservation status and main threats

CITES Appendix II since 2016 (CoP17 Proposal 26).

EU Regulation 2017/160 [EG]: Annex: B.

In Germany strictly and particularly protected under BNatSchG [BG] Status: b.

IUCN-Red List status: EN – (Endangered B1ab(iii) assessed 01 March 2007).

The main threat for all arboreal alligator lizards is the massive habitat destruction. Cloud forests of Central America are one of the most endangered habitats worldwide. Illegal collection for the pet trade and hunting by rural people pose further threat. Arboreal alligator lizards are thought to be highly venomous and killed when seen.

Reproduction

Secondary sexual traits	♀♀ more slender than ♂♂; head of ♂♂ wider and more prominent
Sexual maturity	With 2 - 3 years and 17 - 20 cm total length
Reproduction	Viviparous
Mating season	End of summer / autumn. The copula can take several hours or even days
Birth season	March / April
Litter size (Min. – Max.)	2 - 11
Gestation period	8 - 9 months
F2 Generation bred	Yes
Offspring size	Ca. 5 cm
Sperm storage	Unknown

Husbandry and captive breeding 

Trigger for reproduction (e.g. technical equipment, care, social and climatic conditions)	Annual changes in temperature, illumination and watering. During the hibernation period, night temperatures should be between 12 and 8 °C and day temperatures between 12 and 16 °C. An UV-radiation spot with temperatures between 25 - 30 °C should be provided. Daily water spraying during summer and every second day during hibernation is needed. It is not possible to keep several males together due to their aggressive behavior, especially during the mating season. 1.1 or small groups of 1.2 are preferable and can easily kept together year-round
Keeping difficulty	Not difficult if the above-mentioned conditions are ensured. A rich diet with a variety of insects supplemented with minerals and vitamins, especially for the juveniles, is important
General characteristics, difficulties with keeping and breeding	During frost-free season, individuals should be kept in vegetation rich, outdoor mesh terrariums with a minimum size of 60 x 60 x 80 cm (L x W x H). This is mandatory for all *Abronia* species. During wintertime, these enclosures should be placed in a temperate cool but frost-protected room indoors. An UV-Spot with max. temperatures of 25 - 30 °C under the spot at day and nighttime cooling to temperatures below 10 °C is necessary while keeping indoors. Juveniles are kept and handled similar to adults. Due to the potential aggressive behavior, it is not recommended to keep more than three juveniles together. As soon as freezing temperatures are not expectable any more, the enclosures should be placed outdoors. Keeping of the species is only recommended for advanced and experienced keepers. Indoors keeping through the whole year is not appropriate. Typical lizard diseases such as worms and protozoans, can occur in these arboreal alligator lizards. High parasite infestation is sign of a potential illegal wild catch. Captive bred generations should be minimally infested or completely parasite free. Infestation with the snake mite *Ophionyssus natricis* can rapidly end fatal and should therefore be immediately treated. Frontline® has been proven to be an appropriate treatment
Number of evaluated questionnaires/interviewed persons (institution/private/scientists/commercial breeder)	1 (private)

The species is kept and bred in captivity occasionally in Europe and the USA.

References

CAMPBELL J.A & D.R. FROST (1993): Anguid lizards of the genus *Abronia*: revisionary notes, descriptions of four new species, a phylogenetic analysis, and key. Bulletin of the American Museum of Natural History **216**: 1-121.

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Author: Christian Langner **27.07.2019**

Abronia matudai (HARTWEG & TIHEN, 1946)

Matuda's Arboreal Alligator Lizard

Spanish: Escorpión Arborícola de Matuda

German: Matuda's Baumschleiche

No photo available

Morphology

Snout-vent length up to 96 mm.

The dorsum is bright green with several dark, sometimes only subtle crossbands. The venter is pale grey, blue-grey or slight brown with scattered black dots.

Geographic distribution, Habitat

Southwest of Guatemala and southeast Chiapas, Mexico. In Guatemala only known from two localities in the surroundings of San Marcos in 2300 - 2630 m asl. The habitats in these localities are pine-oak mixed forests and pine-cypress mixed forest. In Mexico is only known from cloud forest on the slopes of the volcano Tacaná, above the village of Colonia Talaquian, between 1950 und 2000 m asl.

Type locality: Volcano Tacaná, Chiapas, 2000 m asl.

Conservation status and main threats

CITES Appendix II (since 2016, CoP17 Proposal 26).

EU Regulation 2017/160 [EG] Annex: B.

In Germany strictly and particularly protected under BNatSchG [BG] Status: b.

IUCN- Red List status: EN – Endangered B1ab(iii) (assessed 6 March 2012).

The main threat for all arboreal alligator lizards is the massive habitat destruction. Cloud forests of Central America are one of the most endangered habitats worldwide. Illegal collection for the pet trade and hunting by rural people pose further threats. Arboreal alligator lizards are thought to be highly venomous and killed when seen.

Reproduction

Up to date unknown.

Husbandry and captive breeding X

Obviously not kept in captivity.

References

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Author: Christian Langner **13.08.2019**

Abronia meledona CAMPBELL & BRODIE, 1999

Arboreal Alligator Lizard

Spanish: Dragoncito de Soledad Grande

German: Meledona-Baumschleiche

No photo available

Morphology

Snout-vent length up to 105 mm.

The dorsal ground color is pink-cream grading to pale green on the flanks. On the dorsum of the head and body black dots can form crossbands. The region around the eye and the supra-auricular spinelike scales is bright yellow. The spinelike supra-auricular scales classify *A. meledona* in the subgenus *Auriculabronia* (CAMPBELL & FROST 1993).

Geographic distribution, Habitat

Southeast Guatemala (Jalapa). Hardwood forest with old oak trees in 2200 - 2660 m asl.

Type locality: near Torre de Guatel, near Soledad Grande, Jalapa, Guatemala, 2660 m asl (14° 31' N, 90° 09' W). The locality is 4 km airline east-southeast of Mataquescuintla on the lower slope of the catchment area of Rio Tapalapa.

Conservation status and main threats

CITES Appendix I since 2016 (CoP17 Proposal 26).

EU Regulation 2017/160 [EG] Annex: A.

In Germany strictly and particularly protected under BNatSchG [BG] Status: s.

IUCN-Red List status: EN (Endangered B1ab(iii) – assessed 06 March 2012).

The main threat for all arboreal alligator lizards is the massive habitat destruction. Cloud forests of Central America are one of the most endangered habitats worldwide. Illegal collection for the pet trade and harassment from rural people pose further threats. Arboreal alligator lizards are thought to be highly venomous and killed when seen.

Reproduction

No data available.

Husbandry and captive breeding X

There are no data on keeping or breeding available.

References

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Author: Christian Langner **27.07.2019**

Abronia mitchelli CAMPBELL, 1982

Mitchells's Arboreal Alligator Lizard

Spanish: Escorpión Arborícola de Mitchell

German: Mitchellss Baumschleiche

No photo available

Morphology

Snout-vent length up to 105 mm.

The dorsal ground color is grey-green flecked with black. Is the only species belonging to the subgenus *Aenigmabronia.* Up to date is only known from a single specimen.

Geographic distribution, Habitat

Sierra Juarez, Oaxaca Mexico.

Type locality: Cerro Pelón, Northern slope of the Sierra Juárez, Oaxaca, Mexico. Cloud forest at 2750 m asl.

Conservation status and main threats

CITES Appendix II since 2016 (CoP17 Proposal 26).

EU Regulation 2017/160 [EG]: Annex: B.

In Germany strictly and particularly protected under BNatSchG [BG] Status: b.

IUCN- Red List status: DD - Data Deficient (assessed 1 March 2007).

The main threat for all arboreal alligator lizards is the massive habitat destruction. Cloud forests of Central America are one of the most endangered habitats worldwide. Illegal collection for the pet trade and hunting by rural people pose further threats. Arboreal alligator lizards are thought to be highly venomous and killed when seen.

Reproduction

No data available.

Husbandry and captive breeding X

No data on keeping or breeding available.

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LANGNER, C. (2014): Baumschleichen der Gattung *Abronia*. Terraria-Elaphe **2014**(1): 14-26.

Author: Christian Langner **13.08.2019**

Abronia mixteca BOGERT & PORTER, 1967

Mixtecan Arboreal Alligator Lizard

Spanish: Escorpión Arborícola Mixteco

German: Mixteca-Baumschleiche

Abronia mixteca Photo Credit: Christian Langner

Morphology

Snout-vent length up to 103 mm; total length 245 mm.

The ground color of the head and dorsum is bright grey or green. It has irregular yellow and black flecking on the body. The venter is white cream. The surrounding of the eye is yellow. Sometimes it has crossbands along the body and tail.

Abronia mixteca belongs to the nominate subgenus *Abronia*.

Geographic distribution, Habitat

Abronia mixteca occurs in montane pine-oak forests with trees heavily covered with epiphytes such as bromeliads and orchids in the Mexican states of Guerrero and Oaxaca.

Type locality: near Tejocotes, Oaxaca, Mexico at ca. 2400 m asl (17° 14’ N, 96° 59’ W).

Conservation status and main threats

CITES Appendix II since 2016 (CoP17 Proposal 26).

EU Regulation 2017/160 [EG] Annex: B.

In Germany strictly and particularly protected under BNatSchG [BG] Status: b.

IUCN- Red List status: VU - Vulnerable B1ab(iii) (assessed 1 March 2007).

The main threat for all arboreal alligator lizards is the massive habitat destruction. Cloud forests of Central America are one of the most endangered habitats worldwide. Illegal collection for the pet trade and hunting by rural people pose further threats. Arboreal alligator lizards are thought to be highly venomous and killed when seen.

Reproduction

Secondary sexual traits	♀♀ more slender than ♂♂; head of ♂♂ wider and more prominent
Sexual maturity	With 2 - 3 years, 17 - 20 cm total length
Reproduction	Viviparous
Mating season	Late summer / autumn; the copula can take several hours and up to several days
Birth season	March / April
Litter size (Min. – Max.)	6 - 11
Gestation period	8 - 9 months
F2 Generation bred	Yes
Offspring size / weight	Ca. 5 cm
Sperm storage	Unknown

Husbandry and captive breeding

Trigger for reproduction (e.g. technical equipment, care, social and climatic conditions)	Annual changes in temperature, illumination and watering. During the hibernation period, night temperatures should be between 12 and 8 °C and day temperatures between 12 and 16 °C. An UV-radiation spot with temperatures between 25 - 30 °C should be provided. Daily water spraying during summer and every second day during hibernation is needed. It is not possible to keep several males together due to their aggressive behavior, especially during the mating season. 1.1 or small groups of 1.2 are preferable and can easily kept together year-round
Keeping difficulty	Not difficult if the above mentioned conditions are ensured. A rich diet with a variety of insects supplemented with minerals and vitamins, especially for the juveniles, is important

General characteristics, difficulties with keeping and breeding	During frost-free season, individuals should be kept in vegetation rich, outdoor mesh terrariums with a minimum size of 60 x 60 x 80 cm (L x W x H). This is mandatory for all *Abronia* species. During wintertime, these enclosures should be placed in a temperate cool but frost-protected room indoors. An UV-Spot with max. temperatures of 25 - 30 °C under the spot at day and nighttime cooling to temperatures below 10 °C is necessary while keeping indoors. Juveniles are kept and handled similar to adults. Due to the potential aggressive behavior, it is not recommended to keep more than three juveniles together. As soon as freezing temperatures are not expectable any more, the enclosures should be placed outdoors. Keeping of the species is only recommended for advanced and experienced keepers. Indoor keeping through the whole year is not appropriate. Typical lizard diseases such as worms and protozoans, can occur in these arboreal alligator lizards. High parasite infestation is sign of a potential illegal wild catch. Captive bred generations should be minimally infested or completely parasite free. Infestation with the snake mite *Ophionyssus natricis* can rapidly end fatal and should therefore be immediately treated. Frontline® has been proven to be an appropriate treatment
Number of evaluated questionnaires	2 (private)

Abronia mixteca is occasionally kept and bred in Europa and USA.

References

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Author: Christian Langner **27.07.2019**

Abronia montecristoi HIDALGO, 1983

Monte Cristo Arboreal Alligator Lizard

Spanish: Dragoncito de Montecristo Metapán

German: Monte-Cristo-Baumschleiche

No photo available

Morphology

Snout-vent length up to 90 mm.

The dorsum is dark blue. The head and nuchal region are darker than the body. It has brown marks and crossbands on the flanks. The venter is bright grey. MCCRANIE & WILSON (1999) described one of the living specimen's color as antic-brown with small bright cinnamon crossbands.

Abronia montecristoi belongs to the subgenus *Abaculabronia.*

Geographic distribution, Habitat

In El Salvador near the border triangle El Salvador-Honduras-Guatemala. In the west of Honduras near Quebrada Grande. Cloud forest between 1370 – 2250 m asl.

Type locality: Hacienda Montecristo, Metapán, Santa Ana, El Salvador, 2250 m.

Conservation status and main threats

CITES Appendix II (since 2016 CoP17 Proposal 25).

EU Regulation 2017/160 [EG] Annex: B.

In Germany strictly and particularly protected under BNatSchG [BG] Status: b.

IUCN- Red List status: EN - Endangered B1ab(iii) (assessed May 2012).

The main threat for all arboreal alligator lizards is the massive habitat destruction. Cloud forests of Central America are one of the most endangered habitats worldwide. Illegal collection for the pet trade and hunting by rural people pose further threats. Arboreal alligator lizards are thought to be highly venomous and killed when seen.

Reproduction

No data available.

Husbandry and captive breeding X

No data available.

References

ARIANO-SÁNCHEZ, C. & L. MELENDEZ (2014): Baumschleichen der Gattung *Abronia* in Guatemala. Terraria-Elaphe **2014**(3): 44-48.

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Author: Christian Langner **27.07.2019**

Abronia oaxacae (GÜNTHER, 1885)

Oaxacan Arboreal Alligator Lizard
Spanisch: Escorpión Arborícola de Oaxaca
German: Oaxaca-Baumschleiche

Abronia oaxacae Photo Credit: Anonymus/Archive Ch. Langner

Morphology

The ground color is usually bright to dark grey. Some individuals can be predominantly brown. It sometimes has black flecking or crossbands along the body. The venter is bright grey.

Abronia oaxacae belongs to the nominate subgenus *Abronia*.

Geographic distribution, Habitat

Abronia oaxacae occurs in Tehuantepec, Oaxaca, Mexico, in pine-oak mixed forests between 2100 and 2743 m asl.

Type locality: Oaxaca, Mexico.

Conservation status and main threats

CITES Appendix II since 2016 (CoP17 Proposal 26).

EU Regulation 2017/160 [EG] Annex: B.

In Germany strictly and particularly protected under BNatSchG [BG] Status: b.

IUCN- Red List status: VU - Vulnerable B1ab(iii) (assessed 1 March 2007).

The main threat for all arboreal alligator lizards is the massive habitat destruction. Cloud forests of Central America are one of the most endangered habitats worldwide. Illegal collection for the pet trade and hunting by rural people pose further threats. Arboreal alligator lizards are thought to be highly venomous and killed when seen.

Abronia oaxacae has been rarely found and very few is known about this species.

Reproduction

Secondary sexual traits	♀♀ more slender than ♂♂; head of ♂♂ wider and more prominent
Sexual Maturity	14 months
Reproduction	Viviparous
Mating season	Unknown
Birth season	Spring
Litter size (Min. – Max.)	8 - 12
Gestation period	9 - 12 months
Offspring size / weight	Unknown
Sperm storage	Unknown

Husbandry and captive breeding 

Trigger for reproduction (e.g. technical equipment, care, social and climatic conditions)	Annual changes in temperature, illumination and watering. During the hibernation period, night temperatures should be between 12 and 8 °C and day temperatures between 12 and 16 °C. An UV-radiation spot with temperatures between 25 - 30 °C should be provided. Daily water spraying during summer and every second day during hibernation is needed. It is not possible to keep several males together due to their aggressive behavior, especially during the mating season. 1.1 or small groups of 1.2 are preferable and can easily kept together year-round
Keeping difficulty	Not difficult if the above-mentioned conditions are ensured. A rich diet with a variety of insects supplemented with minerals and vitamins, especially for the juveniles, is important
General characteristics, difficulties with keeping and breeding	During frost-free season, individuals should be kept in vegetation rich, outdoor mesh terrariums with a minimum size of 60 x 60 x 80 cm (L x W x H). This is mandatory for all *Abronia* species. During wintertime, these enclosures should be placed in a temperate cool but frost-protected room indoors. UV-Spot with max. temperatures of 25 - 30 °C under the spot at day and nighttime cooling to temperatures below 10 °C is necessary while keeping indoors. Juveniles are kept and handled similar to adults. Due to the potential aggressive behavior, it is not recommended to keep more than three juveniles together. As soon as freezing temperatures are not expectable any more, the enclosures should be placed outdoors. Keeping of the species is only recommended for advanced and experienced keepers. Indoor keeping through the whole year is not appropriate. Typical lizard diseases such as worms and protozoans, can occur in these arboreal alligator lizards. High parasite infestation is sign of a potential illegal wild catch. Captive bred generations should be minimally infested or completely parasite free. Infestation with the snake mite *Ophionyssus natricis* can rapidly end fatal and should therefore be immediately treated. Frontline® has been proven to be an appropriate treatment
Number of evaluated questionnaires/interviewed persons (institution/private/scientists/commercial breeder)	1 (private)

Abronia oaxacaea is very rarely kept and bred in Europe and USA.

References

CAMPBELL, J.A. (2007): *Abronia oaxacae*. The IUCN Red List of Threatened Species 2007: e.T63685A12697055

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Author: Christian Langner **27.07.2019**

Abronia ochoterenai (MARTIN DEL CAMPO, 1939)

Ochoterena's Arboreal Alligator Lizard, Northern Chiapas Arboreal Alligator Lizard

Spanish: Escorpión Arborícola de Ochoterena

German: Ochoterenas Baumschleiche

Abronia ochoterenai Photo Credit: Peter Heimes

Morphology

Snout-vent length up to 97 mm.

In preservative, the color of the dorsum of the holotype is grey, and the venter is horn colored. On the internet (Herp. MX, Facebook 2016) an orange coloration of the dorsum has been reported. *Abronia ochoterenai* belongs to the subgenus *Abaculabronia.*

Geographic distribution, Habitat

Chiapas, Mexico, according to Acevedo et al. 2010 also in Guatemala. Cloud forest in 1800 - 2300 m asl.

Type locality: Santa Rosa, Comitán, Chiapas, Mexico.

Abronia ochoterenai was considered lost for 76 years, since the type locality could not be identified. There are 16 localities with the name "Santa Rosa" near Comitán, Chiapas. In 2016 some specimens were found by a team of Mexican researchers (Herp. MX, Facebook 2016).

ACEVEDO et al. (2010) list the species without any specific information on the type locality.

Conservation status and main threats

CITES Appendix II (since 2016, CoP17 Proposal 26).

EU Regulation 2017/160 [EG] Annex: B.

In Germany strictly and particularly protected under BNatSchG [BG] Status: b.

IUCN- Red List status: DD – Data Deficient (assessed 6 May 2012).

The main threat for all arboreal alligator lizards is the massive habitat destruction. Cloud forests of Central America are one of the most endangered habitats worldwide. Illegal collection for the pet trade and hunting by rural people pose further threats. Arboreal alligator lizards are thought to be highly venomous and killed when seen.

Reproduction

No data available.

Husbandry and captive breeding X

No data available.

References

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Author: Christian Langner **27.07.2019**

Abronia ornelasi CAMPBELL, 1984

Ornelas's Arboreal Alligator Lizard, Cerro Baul Alligator Lizard

Spanish: Escorpión Arborícola de Ornelas

German: Cerro-Baul-Baumschleiche

No photo available

Morphology

Snout- vent length up to 96 mm.

The color of the dorsum is brown with a slight green sheen. The sides of the head, body and limbs can be pink or red. The venter is pale grey-green.

Geographic distribution, Habitat

Border region between Oaxaca and Chiapas, Mexico in 1500 - 1600 m asl.

Type locality: Cerro Baul, border Oaxaca-Chiapas, Mexico, 2000 m asl.

Conservation status and main threats

CITES Appendix II (since 2016, CoP17 Proposal 26).

EU Regulation 2017/160 [EG] Annex: B.

In Germany strictly and particularly protected under BNatSchG [BG] Status: b.

IUCN- Red List status: DD – Data Deficient (assessed March 2007).

The main threat for all arboreal alligator lizards is the massive habitat destruction. Cloud forests of Central America are one of the most endangered habitats worldwide. Illegal collection for the pet trade and hunting by rural people pose further threats. Arboreal alligator lizards are thought to be highly venomous and killed when seen.

Reproduction

No data available.

Husbandry and captive breeding X

No data available.

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Author: Christian Langner **27.07.2019**

Abronia ramirezi CAMPBELL, 1994

Ramirez's Alligator Lizard

German: Ramirez-Baumschleiche

Spanish: Escorpión Arborícola de Ramirez

No photo available

Morphology

Snout-vent length up to 93 mm.

The dorsal ground color is grey with yellow flecking. It has 10 irregular dark brown crossbands from the nuchal region to the beginning of the tail. The venter is cream and the venter of the hindlimbs is bright yellow.

Geographic distribution, Habitat

West of Chiapas, Mexico, at 1350 m asl. Their habitat is semi-evergreen tropical forests with some montane vegetation.

Type locality: Rancho El Recuerdo, Cerro La Vela, Sierra Madre de Chiapas, Municipio de Jiquipilas, Chiapas, Mexico, 1350 m.

Conservation status and main threats

CITES Annex II since 2016 (CoP17 Proposal 26).

EU Regulation 2017/160 [EG] Annex: B.

In Germany strictly and particularly protected under BNatSchG [BG] Status: b.

IUCN-Red List status: DD - Data Deficient (assessed 1 March 2007).

The main threat for all arboreal alligator lizards is the massive habitat destruction. Cloud forests of Central America are one of the most endangered habitats worldwide. Illegal collection for the pet trade and hunting by rural people pose further threats. Arboreal alligator lizards are thought to be highly venomous and killed when seen.

Reproduction

No data available.

Husbandry and captive breeding X

No data on keeping/breeding are available.

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Author: Christian Langner **15.08.2019**

Abronia reidi WERLER & SHANNON, 1961

Reid's Arboreal Alligator Lizard

Spanish: Escorpión Arborícola de Reid

German: Reids Baumschleiche

Abronia reidi Photo Credit: Peter Heimes

Morphology

Snout-vent length up to 91 mm.

The dorsal ground color is dark olive-green. The edge of the scales of the dorsum can be pale yellow. The venter is brighter and has more yellow content than the dorsum. HEIMES (2002) reports a specimen kept in captivity, which showed a physiological color change. The characteristic olive-green ground color turned to dark brown.

Abronia reidi belongs to the subgenus *Abaculabronia.*

Geographic distribution, Habitat

Volcanoes San Martin and Santa Marta, Sierra de los Tuxtlas, Veracruz, Mexico, in 1000 - 1635 m asl.

Type locality: crater of volcano San Martin, Veracruz, Mexico.

Conservation status and main threats

CITES Appendix II (since 2016, CoP17 Proposal 26).

EU Regulation 2017/160 [EG] Annex: B.

In Germany strictly and particularly protected under BNatSchG [BG] Status: b.

IUCN- Red List status: DD – Data Deficient (assessed 7 March 2007).

The main threat for all arboreal alligator lizards is the massive habitat destruction. Cloud forests of Central America are one of the most endangered habitats worldwide. Illegal collection for the pet trade and hunting by rural people pose further threats. Arboreal alligator lizards are thought to be highly venomous and killed when seen.

Reproduction

No data available.

Husbandry and captive breeding X

A few individuals were kept in a lab in Mexico (THESING *et al.* 2017).

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Author: Christian Langner **19.08.2019**

Abronia salvadorensis HIDALGO, 1983

Salvador Arboreal Alligator Lizard

Spanish: Dragoncito de la Sierra de Morazán

German: El-Salvador-Baumschleiche

Morphology

Snout-vent length up to 94 mm.

The dorsum has five dark, fishbone shaped crossbands. The crossbands are separated with cream colored scales. The color of the head is cream or greyish. The tail has four dark brown crossbands. The color of the venter is cream.

Abronia salvadorensis is the only representative of the subgenus *Lissabronia.*

Geographic distribution, Habitat

Sierra de Montecillos and Sierra de Opalaca in Honduras and the surrounding area in El Salvador. Cloud forests in 1900 - 2250m asl.

Type locality: Palo Blanco, 10 km northeast of Perquin, Corrdillera de Nahuaterique Departmento de Morazan, at 1900 m asl.

Conservation status and main threats

CITES Appendix II (since2016, CoP17 Proposal 25).

EU Regulation 2017/160 [EG] Annex: B.

In Germany strictly and particularly protected under BNatSchG [BG] Status: b.

IUCN- Red List status: DD – Data Deficient B1ab(iii) (assessed 6 Mai 2012).

The main threat for all arboreal alligator lizards is the massive habitat destruction. Cloud forests of Central America are one of the most endangered habitats worldwide. Illegal collection for the pet trade and hunting by rural people pose further threats. Arboreal alligator lizards are thought to be highly venomous and killed when seen.

Reproduction

No data available.

Husbandry and captive breeding X

No data available.

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Author: Christian Langner **13.08.2019**

Abronia smithi CAMPBELL & FROST, 1993

Smith's Arboreal Alligator Lizard

German: Smiths Baumschleiche

Spanish: Escorpión Arborícola de Smith

Abronia smithi Photo Credit: Christian Langner

Morphology

Snout-vent length up to 103 mm.

Strong sexual dichromatism. The ground color of males is yellow-green with most of the dorsal scales mottled with black. The region around the eye is pale yellow. The supra-auricular spinelike scales are usually pale green or yellowish. The venter is usually bright green. In females, the ground color is more intense and colorful with more black contents than in males. The supra-auricular spinelike scales classify this species in the subgenus *Auriculabronia* (CAMPBELL & FROST 1993).

Geographic distribution, Habitat

Cloud forest in Sierra Madre de Chiapas, southeast Chiapas, Mexico from 1800 - 2800 m asl.

Type locality: Southeast slope of Cerro el Triúnfo, Sierra Madre de Chiapas, Mexico, 13.1 km (airline) NNE of Mapastepec at 15° 40'N, 92° 48' W. Elevation: 2020 m.

Conservation status and main threats

CITES Annex II since 2016 (CoP17 Proposal 26).

Regulation (EU) 2017/160 [EG] Annex: B.

In Germany strictly and particularly protected under BNatSchG [BG] Status: b.

IUCN- Red List status: LC - Least Concern (assessment 1 March 2007).

The main threat for all arboreal alligator lizards is the massive habitat destruction. Cloud forests of Central America are one of the most endangered habitats worldwide. Illegal collection for the pet trade and hunting by rural people pose further threats. Arboreal alligator lizards are thought to be highly venomous and killed when seen.

Reproduction

Secondary sexual traits	♀♀ more slender than ♂♂; head of ♂♂ wider and more prominent; sexual dichromatism (see above)
Sexual maturity	After ca. 2 years
Reproduction	Viviparous
Mating season	End of summer / autumn
Birth season	March / April
Litter size	7 - 12
Gestation period	7 - 9 months
F2 Generation bred	Not yet
Offspring size / weight	< 5 cm
Sperm storage	Unknown

Husbandry and captive breeding

Trigger for reproduction (e.g. technical equipment, care, social and climatic conditions)	Annual changes in temperature, illumination and watering. During the hibernation period, night temperatures should be between 12 and 8 °C and day temperatures between 12 and 16 °C. An UV-radiation spot with temperatures between 25 - 30 °C should be provided. Daily water spraying during summer and every second day during hibernation is needed. It is not possible to keep several males together due to their aggressive behavior, especially during the mating season. 1.1 or small groups of 1.2 are preferable and can easily kept together year-round
Keeping difficulty	Not difficult if the above mentioned conditions are ensured. A rich diet with a variety of insects supplemented with minerals and vitamins, especially for the juveniles, is important

General characteristics, difficulties with keeping and breeding	During frost-free season, individuals should be kept in vegetation rich, outdoor mesh terrariums with a minimum size of 60 x 60 x 80 cm (L x W x H). This is mandatory for all *Abronia* species. During wintertime, these enclosures should be placed in a temperate cool but frost-protected room indoors. An UV-Spot with max. temperatures of 25 - 30 °C under the spot at day and nighttime cooling to temperatures below 10 °C is necessary while keeping indoors. Juveniles are kept and handled similar to adults. Due to the potential aggressive behavior, it is not recommended to keep more than three juveniles together. As soon as freezing temperatures are not expectable any more, the enclosures should be placed outdoors. Keeping of the species is only recommended for advanced and experienced keepers. Indoor keeping through the whole year is not appropriate. Typical lizard diseases such as worms and protozoans, can occur in these arboreal alligator lizards. High parasite infestation is sign of a potential illegal wild catch. Captive bred generations should be minimally infested or completely parasite free. Infestation with the snake mite *Ophionyssus natricis* can rapidly end fatal and should therefore be immediately treated. Frontline® has been proven to be an appropriate treatment
Number of evaluated questionnaires/interviewed persons (institution/private/scientists/commercial breeder)	2 (private)

Occasionally kept and bred in Europe and USA.

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LANGNER, C. (2014): Baumschleichen der Gattung *Abronia*. Terraria-Elaphe **2014**(1): 14-26.

Author: Christian Langner **19.08.2019**

Abronia taeniata (WIEGMANN, 1828)

Banded Arboreal Alligator Lizard, Bromeliad Arboreal Alligator Lizard

Spanish: Escorpión Arborícola de Bandas

German: Gebänderte Baumschleiche

Abronia taeniata Photo Credit: Christian Langner

Morphology

Snout-vent length up to 115 mm.

The dorsum has six to eight black and white or black and yellow contrasting crossbands. The crossbands have sometimes dark brown, olive-green or blue parts. The dorsal crossbands extend to the tail sometimes the crossbands are not present. The ventral color is cream.

Geographic distribution, Habitat

East Mexico; there is evidence that it occurs in the following Mexican localities: Tamaulipas, San Luis Potosi, Hidalgo, Puebla and Quéretaro.

Type locality: El Chico, Hidalgo, Mexico (SMITH & TAYLOR 1950).

Conservation status and main threats

CITES Appendix II (since 2016, CoP17 Proposal 26).

EU Regulation 2017/160 [EG]: Annex B.

In Germany strictly and particularly protected under BNatSchG [BG] Status: b.

IUCN- Red List status: VU – Vulnerable B1ab(iii) (assessed 01 March 2007).

The main threat for all arboreal alligator lizards is the massive habitat destruction. Cloud forests of Central America are one of the most endangered habitats worldwide. Illegal collection for the pet trade and hunting by rural people pose further threats. Arboreal alligator lizards are thought to be highly venomous and killed when seen.

Reproduction

Secondary sexual traits	♀♀ more slender than ♂♂; head of ♂♂ wider and more prominent; ♂♂ have usually more intense coloration
Sexual maturity	After ca. 2 years, at 16 - 18 cm total length
Reproduction	Viviparous. The copula can take several hours or even days
Mating season	End of summer / autumn
Birth season	March / April
Litter size (Min. – Max.)	2 - 8
Gestation period	6 - 8 months
F2 Generation bred	Yes
Offspring size / weight	4 cm / 1 g
Mortality	< 10 %
Sperm storage	Unknown
% of offspring that achieves sexual maturity	> 90 %
Lifespan in captivity	> 10 years

Husbandry and captive breeding

Trigger for reproduction (e.g. technical equipment, care, social and climatic conditions)	Annual changes in temperature, illumination and watering. During the hibernation period, night temperatures should be between 12 and 8 °C and day temperatures between 12 and 16 °C. An UV-radiation spot with temperatures between 25 - 30 °C should be provided. Daily water spraying during summer and every second day during hibernation is needed. It is not possible to keep several males together due to their aggressive behavior, especially during the mating season. 1.1 or small groups of 1.2 are preferable and can easily kept together year-round
Keeping difficulty	Not difficult if the above mentioned conditions are ensured. A rich diet with a variety of insects supplemented with minerals and vitamins, especially for the juveniles, is important
General characteristics, difficulties with keeping and breeding	During frost-free season, individuals should be kept in vegetation rich, outdoor mesh terrariums with a minimum size of 60 x 60 x 80 cm (L x W x H). This is mandatory for all *Abronia* species. During wintertime, these enclosures should

	be placed in a temperate cool but frost-protected room indoors. An UV-Spot with max. temperatures of 25 - 30 °C under the spot at day and nighttime cooling to temperatures below 10 °C is necessary while keeping indoors. Juveniles are kept and handled similar to adults. Due to the potential aggressive behavior, it is not recommended to keep more than three juveniles together. As soon as freezing temperatures are not expectable any more, the enclosures should be placed outdoors. Keeping of the species is only recommended for advanced and experienced keepers. Indoor keeping through the whole year is not appropriate. Typical lizard diseases such as worms and protozoans, can occur in these arboreal alligator lizards. High parasite infestation is sign of a potential illegal wild catch. Captive bred generations should be minimally infested or completely parasite free. Infestation with the snake mite *Ophionyssus natricis* can rapidly end fatal and should therefore be immediately treated. Frontline® has been proven to be an appropriate treatment
Number of evaluated questionnaires/interviewed persons (institution/private/scientists/commercial breeder)	5 (private)

In Europe and the US the species is kept and bred regularly.

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Author: Christian Langner **15.08.2019**

Abronia vasconcelosii (BOCOURT, 1872)

Bocourt's Arboreal Alligator Lizard

Spanish: Dragoncito de la meseta de Guatemala

German: Guatemala-Baumschleiche

Abronia vasconcelosii Photo Credit: Christian Langner

Morphology

Snout-vent length up to 123 mm.

The dorsal ground color is green, yellow-green up to slight turquoise, with pigmented dorsal scales. The head scales are accentuated with black vermiculations. The region around the eye, the rostral and sub-labial scales as well as the spinelike supra-auricular scales are bright to pale yellow. The spinelike supra-auricular scales classify *Abronia vasconselosii* in the subgenus *Aculabronia.* The venter and flanks are slightly yellow, cream or green-white. The juveniles are bright green.

Geographic distribution, Habitat

The species occurs on the Guatemalan plateau in cloud forests between 2000 and 2200 m asl. *Abronia vasconselosii* had been classified as a junior synonym of *A. aurita* (CAMPBELL & FROST 1993). This leads to considerable misperceptions of the distribution range of both taxa which is still unclear. Meanwhile they are considered to be separate species.

Type locality: Arguetta [= Argueta], Guatémala, above 2000 m asl.

Conservation status and main threats

CITES Appendix II since 2016 (CoP17 Proposal 25).

EU Regulation 2017/160 [EG]: Annex: B.

In Germany strictly and particularly protected under BNatSchG [BG] Status: s.

IUCN- Red List status: VU – Vulnerable B1ab(iii) (assessed May 2012).

The main threat for all arboreal alligator lizards is the massive habitat destruction. Cloud forests of Central America are one of the most endangered habitats worldwide. Illegal collection for the pet trade and hunting from rural people pose further threats. Arboreal alligator lizards are thought to be highly venomous and killed when seen.

Reproduction

Secondary sexual traits	♀♀ more slender than ♂♂; head of ♂♂ wider and more prominent; ♂♂ more colorful
Sexual maturity	With about 2 years
Reproduction	Viviparous. The copula can take several hours or even days
Mating season	Late summer/ autumn; copula can take several hours up to days
Birth season	March / April
Litter size (Min. – Max.)	4 - 16
Gestation period	Up to 8 months
F2 Generation bred	Yes
Offspring size / weight	3 cm / 1 g
Sperm storage	Unknown

Husbandry and captive breeding

Trigger for reproduction (e.g. technical equipment, care, social and climatic conditions)	Annual changes in temperature, illumination and watering. During the hibernation period, night temperatures should be between 12 and 8 °C and day temperatures between 12 and 16 °C. An UV-radiation spot with temperatures between 25 - 30 °C should be provided. Daily water spraying during summer and every second day during hibernation is needed. It is not possible to keep several males together due to their aggressive behavior, especially during the mating season. 1.1 or small groups of 1.2 are preferable and can easily kept together year-round
Keeping difficulty	Not difficult if the above mentioned conditions are ensured. A rich diet with a variety of insects supplemented with minerals and vitamins, especially for the juveniles, is important

General characteristics, difficulties with keeping and breeding	During frost-free season, individuals should be kept in vegetation rich, outdoor mesh terrariums with a minimum size of 60 x 60 x 80 cm (L x W x H). This is mandatory for all *Abronia* species. During wintertime, these enclosures should be placed in a temperate cool but frost-protected room indoors. An UV-Spot with max. temperatures of 25 - 30 °C under the spot at day and nighttime cooling to temperatures below 10 °C is necessary while keeping indoors. Juveniles are kept and handled similar to adults. Due to the potential aggressive behavior, it is not recommended to keep more than three juveniles together. As soon as freezing temperatures are not expectable any more, the enclosures should be placed outdoors. Keeping of the species is only recommended for advanced and experienced keepers. Indoor keeping through the whole year is not appropriate. Typical lizard diseases such as worms and protozoans, can occur in these arboreal alligator lizards. High parasite infestation is sign of a potential illegal wild catch. Captive bred generations should be minimally infested or completely parasite free. Infestation with the snake mite *Ophionyssus natricis* can rapidly end fatal and should therefore be immediately treated. Frontline® has been proven to be an appropriate treatment
Number of evaluated questionnaires/interviewed persons (institution/private/scientists/commercial breeder)	4 (private)

Kept and bred occasionally in Europe and USA.

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Author: Christian Langner **13.08.2019**

Chamaeleonidae

Rhampholeon acuminatus Mariaux & Tilbury, 2006

Nguru pygmy chameleon

German: Nguru-Zwergchamäleon

Rhampholeon acuminatus Photo Credit: Wolfgang Schmidt

Morphology

Snout-vent length: 47–57 mm; total length: 82 mm.

Rhampholeon acuminatus has a leaflike body shape as most of the *Rhampholeon* species.

Nguru pygmy chameleons possess a wide round rostral appendage and a conspicuous stripe between the eyes. It has spiny scales on the head and along the dorsal crest. The ground color is variable; it can range from shades of green to light brown. The helmet and shoulder could have blue dots. The surrounding of the eye sometimes exhibits yellow or orange flecking. The venter of the body is usually of lighter color.

Geographic distribution, Habitat

Nguru Mountains, Tanzania.

Type locality: Morogoro Region, Nguru Mountains, south of Komkore Forest, above the villages of Ubili, Tanzania (6°2'29" S; 37°30'40.5" E), at 1500 - 1600 m asl.

Conservation status and main threats

CITES Annex II since 2016 (CoP17 Proposal 27, 28).

EU Regulation 2017/160 [EG] Annex: B.

In Germany strictly and particularly protected under BNatSchG [BG] Status: b.

IUCN- Red List status: CR – Critically endangered B1ab(iii,v) (assessed 21 August 2013).

Reproduction

Secondary sexual traits	Tail of ♂♂ slightly longer than of ♀♀; ♀♀ are less rugose
Sexual maturity	After 12 months
Reproduction	Oviparous
Mating season	Late summer/ autumn
Birth season	March / April
Litter size (Min. – Max.)	5 - 9
Clutch/ year	2
Incubation period	Temperature dependent, between 60 and 90 days
Incubation temperature	18 to 20 °C
Hatching rate	> 90 %
Maturity reaching rate	Ca. 80 %
F2 Generation bred	Yes
Offspring size / weight	No data
Sperm storage	Yes
Sex ratio at hatching	Incubation at room temperature 1:1. No evidence of TSD

Husbandry and captive breeding

Trigger for reproduction	Difficult to assess in terrarium. Likely due to changing the dry and rainy season. It does not hibernate
Keeping difficulty	They can be kept in a vegetation rich, humid terrarium with daily temperature of maximum 21 °C and significant night setback. Terrarium should be misted daily. Feeding every two days with invertebrates supplemented with vitamins and minerals. Neon tubes for lightening and daily UV radiation should be used
General characteristics, difficulties with keeping and breeding	They can be kept in pairs, as long as the terrarium size is 30 x 40 x 40 cm, or in groups of 1:2 (males are incompatible)

Care of the young, technical and time effort	Easily maintained in small groups in small moist terrariums. For lightening neon tubes with UV radiation, regulated with a timer, should be used for 1 h daily. Additionally, daily work includes feeding and misting
Breeding difficulty evaluation	Rather difficult, due to the requirements
Frequency of breeding in captivity	Rather infrequent
Number of evaluated questionnaires/interviewed persons (private person/zoological institutions/commercial breeders)	1 (private)

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Author: Christian Langner **13.08.2019**

Rhampholeon beraduccii MARIAUX & TILBURY, 2006

Beraducci's Pygmy Chameleon, Mahenge Pygmy Chameleon

German: Beraduccis Zwergchamäleon

No photo available

Morphology

Snout-vent length: 28 mm; total length: 36 mm.

Rhampholeon beraduccii is the smallest species of the genus. The ground color is yellowish to light brown with several dark flecking. Sometimes it shows two thin diagonal bands along the flanks. It has a conspicuous rostral appendage.

Geographic distribution, Habitat

Mahenge Mountains, Tanzania.

Type locality: Morogoro Region, Mahenge Mountains, Sali FR (8°57'57.4" S, 36°41'17.9"E), at 1000 m asl.

Beraducci's pygmy chameleons have been found in open landscapes in bushes and shrubs, few centimeters above the ground.

Conservation status and main threats

CITES Annex II since 2016 (CoP17 Proposal 27, 28).

EU Regulation 2017/160 [EG] Annex: B.

In Germany strictly and particularly protected under BNatSchG [BG] Status: b.

IUCN- Red List status: VU – Vulnerable D2 (assessed 21 August 2013).

Reproduction

Unknown.

Husbandry and captive breeding X

No keeping of this species is currently known.

References

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Author: Christian Langner **13.08.2019**

Rhampholeon boulengeri STEINDACHNER, 1911

Boulenger's pygmy chameleon

German: Boulengers Zwergchamäleon

Rhampholeon boulengeri Photo Credit: Wolfgang Schmidt

Morphology

Snout-vent length: max. 60 mm; total length: 80 mm.

Rhampholeon boulengeri has a leaflike body shape as most of the *Rhampholeon* species. The ground color is light brown or grey with one or two dark diagonal crossbands in the flanks. The chameleon has a conic small rostral appendage.

Geographic distribution, Habitat

The species occurs in Burundi, Kenya, Rwanda, Uganda, Tanzania and northeast of the Democratic Republic of the Congo.

Type locality: Hill northwest of Tanganyika, Democratic Republic of the Congo.

Conservation status and main threats

CITES Appendix II since 2016 (CoP17 Proposal 27, 28).

EU Regulation 2017/160 [EG] Annex: B.

In Germany strictly and particularly protected under BNatSchG [BG] Status: b.

IUCN- Red List status: LC – Least Concern (assessed 20 August 2013).

Reproduction

Secondary sexual traits	Tail of ♂♂ slightly longer than of ♀
Reproduction	Oviparous
Litter size (Min. – Max.):	2
Incubation period	184 days
Incubation temperature	20 - 23 °C (daytime), 16 - 20 °C (night)

Very few data is available on this species. One gravid female laid a clutch, from which only one hatchling hatched and died after 120 days for an unknown reason (NECAS & SCHMIDT 2004).

Husbandry and captive breeding

Keeping difficulty	They can be kept in a vegetation rich, slightly moist terrarium with daily temperature of 21 - 25 °C and lower temperatures at night. A thick ground leaf layer and dense vegetation is needed. Enclosure should be misted daily. Lizards should be fed every two days with supplemented vertebrates. Neon tubes and daily UV radiation should be used for lightening
Number of evaluated questionnaires/interviewed persons (private person/zoological institutions/commercial breeders)	1 (private)

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Author: Christian Langner **27.07.2019**

Rhampholeon bruessoworum BRANCH, BAYLISS & TOLLEY, 2014

Mount Inago Pygmy Chameleon

German: Bruessows Zwergchamäleon

Rhampholeon bruessoworum Photo Credit: Werner Conradie

Morphology

Snout-vent length: max. 47.5 mm; total length: max. 63 mm.

Small, spine-like scales are running along dorsal crest of the species. The flat helmet-shaped head is spineless. Nasal appendix is not very distinct.

The ground color of *Rhampholeon bruessoworum* contains a brown marbling with red-brown diagonal slashes on the flanks.

Geographic distribution, Habitat

Mount Inago, Zambézia Province, Mozambique. It occurs in tropical rain forest at the base of the Granit island mountain Inago, Zambézia Province, Mozambique.

Type locality: rain forest on the base of the granite inselberg Mount Inago, Zambézia Province, Mozambique (15°04'51" S, 37°23'37" E), at ca. 1478 m asl.

Conservation status and main threats

CITES Annex II since 2016 (CoP17 Proposal 27, 28).

EU Regulation 2017/160 [EG] Annex: B.

In Germany strictly and particularly protected under BNatSchG [BG] Status: b.

IUCN- Red List status: CR – Critically Endangered B1ab(i,ii,iii)+2ab(i,ii,iii) (assessed 13 August 2014).

Reproduction

Oviparous, both females of the type series contained eggs in their oviducts in September.

Husbandry and captive breeding X

No information about keeping available.

References

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Author: Christian Langner **08.07.2019**

Rhampholeon chapmanorum TILBURY, 1992

Chapman's Pygmy Chameleon

German: Chapmans Zwergchamäleon

Rhampholeon chapmanorum Photo credit: Colin Tilbury

Morphology

Snout-vent length: max. 51 mm; total length: 63 mm.

Rhampholeon chapmanorum has a leaf like body shape as most of the *Rhampholeon* species. The ground color is light brown and has dark, sometimes black, crossbands on the flanks. It also shows some white or yellowish flecking on the flanks. It has six sienna brown dots along the dorsum. The iris is red.

Geographic distribution, Habitat

The species is endemic to „Natundu Hills" region in Malawi.

Type locality: evergreen forests above Chididi Police Station, in the summit of Malawi Hills, Natundu Hills Region, Malawi, at 940 m asl.

Conservation status and main threats

CITES Appendix II since 2016 (CoP17 Proposal 27, 28).

EU Regulation 2017/160 [EG] Annex: B.

In Germany strictly and particularly protected under BNatSchG [BG] Status: b.

IUCN- Red List status: CR– Critically Endangered (Possibly Extinct) B1ab(iii)+2ab(iii) (assessed 20 August 2013).

Rhampholeon chapmanorum is considered the rarest chameleon worldwide (HANCE 2014).

In the original habitat is thought to be nearly extinct since the forest is completely destroyed. Luckily, in 1998 a small number of individuals were translocated to a private natural reserve where they could be established and successfully reproduced. In 2016, TIBURY (2018) found some individuals in a small patch of its original habitat.

Reproduction

Reproduction	Oviparous
Litter size	An autopsied female was gravid with 6 undeveloped eggs

Husbandry and captive breeding X

No keeping of the species is known.

References

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Author: Christian Langner **27.07.2019**

Rhampholeon gorongosae BROADLEY, 1971

Gorongoso Pygmy Chameleon

German: Gorongoso-Zwergchamäleon

Rhampholeon gorongosae Photo credit: Colin Tilbury

Morphology

Snout-vent length: max 71 mm; total length: 105 mm.

Rhampholeon gorongosae differs, like *R. marshalli*, from the typically leaf mimicking body shape that most of the *Rhampholeon* species exhibit. Its body shape reminds that of a typical chameleon in miniature. With a total length of over 10 cm, it is one of the biggest species in its genus. A further, very atypical characteristic trait for the genus is the long prehensile tail.

The ground color is very variable. Males showing different grey to green colorations. A light brown line is running across the flanks from the corner of the lower jaw to the end of the tail. Males are smaller than females reaching less than the half of females' total body length. In males, the rostral appendix is much more prominent than in females.

Rhampholeon gorongosae was initially described as a subspecies of *Rhampholeon marshalli.*

Geographic distribution, Habitat

The species is endemic to Mozambique and occurs in sub-montane evergreen forests at 1050 - 1800 m asl.

Type locality: Gorongoso Mts., Manica and Sofale District, Mozambique, at 1200 m asl.

Conservation status and main threats

CITES Annex II since 2016 (CoP17 Proposal 27, 28).

EU Regulation 2017/160 [EG] Annex: B.

In Germany strictly and particularly protected under BNatSchG [BG] Status: b.

IUCN- Red List status: LC – Least Concern (assessed 21 August 2013).

Reproduction

Reproduction	Oviparous
Litter size (Min. – Max.):	A female carried 11 eggs in November

Husbandry and captive breeding X

Up to date there is no data on keeping of the species.

References

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Author: Christian Langner **27.07.2019**

Rhampholeon hattinghi TILBURY & TOLLEY, 2015

Nzawa Pygmy Chameleon

German: Mount-Nzawa-Zwergchamäleon

Rhampholeon hattinghi Photo credit: Colin Tilbury

Morphology

Snout-vent length: max. 56 mm; total length: max. 67 mm.

The ground color of *Rhampholeon hattinghi* is bright brown with olive-green flecking. It has two thin diagonal dark brown or dark green lines across the flanks. The color of the head is dark brown and usually blotched. It has five dark dots below the crest up to the tail region. The venter of the head is cream. The internal side of the forelimbs is pale orange. Males have a slightly longer tails than females.

Geographic distribution, Habitat

The species has only been found in Mount Nzawa, Democratic Republic of the Congo.

Type locality: path edge vegetation in Mount Nzawa, Moba District, Katanga Province, Democratic Republic of the Congo (6° 51.07' S; 29° 35.87' E) at 1700m asl.

Conservation status and main threats

CITES Appendix II since 2016 (CoP17 Proposal 27, 28).

EU Regulation 2017/160 [EG] Annex: B.

In Germany strictly and particularly protected under BNatSchG [BG] Status: b.

IUCN- Red List status: CR– Critically Endangered B1ab (i, ii, iii, v) +2ab (i, ii, iii, v) (assessed 2 June 2015).

The only habitat known for this species is a small forest patch of 2 km^2. The forest is under strong anthropogenic impact and has been reduced to the half from 2008 to 2014. The species is nearly extinct. The forest it inhabits is not protected and it is thought *R. hattinghi* could be extinct in less than a decade (TILBURY 2018).

Reproduction

Reproduction	Oviparous
Litter size (Min. – Max.):	The type female had 2 eggs in its oviduct

Husbandry and captive breeding X

No keeping of the species known.

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Author: Christian Langner **27.07.2019**

Rhampholeon marshalli BOULENGER, 1906

Marshall's Stumptail Chameleon

German: Marshalls Zwergchamäleon

Rhampholeon marshalli Photo Credit: Colin Tilbury

Morphology

Snout-vent length: 73 mm max.; total length: 118 - 130 mm.

Rhampholeon marshalli has a body shape that differs from the typical form of the genus. It is not leaf-shaped, but more like the miniaturization of a typical chameleon. With over 10 cm total length it is one of the largest species in the genus. It has a long and prehensile tail*, which* is atypical in *Rhampholeon.*

The ground color is very variable. Males have different brown, grey, and olive color shapes, sometimes a turquoise and black flecking occurs. The ground color of females is lighter and tends to be more olive-green. Females are larger than males. The rostral appendage is more prominent in males. In males, the post cloacal region is distinctively swollen.

Geographic distribution, Habitat

The species occurs in southeastern Mashonaland in the east of Zimbabwe. It inhabits moderately humid montane forests at higher altitudes.

Type Locality: Chirinda forest, southeastern Mashonaland, Zimbabwe at 1371 m asl.

Conservation status and main threats

CITES Appendix II since 2016 (CoP17 Proposal 27, 28).

EU Regulation 2017/160 [EG] Annex: B.

In Germany strictly and particularly protected under BNatSchG [BG] Status: b.

IUCN- Red List status: VU - Vulnerable B1ab(ii,iii)+2ab(ii,iii) (assessed 26 August 2013).

Reproduction

Reproduction	Oviparous
Clutch size	14 eggs

Husbandry and captive breeding X

No data of keeping is available. A female was observed laying 14 eggs in the wild. When the nest was checked after 35 days, all eggs had hatched except for one that hatched that same day. Therefore, the incubation period is estimated to be of approximately 35 days.

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Author: Christian Langner **27.07.2019**

Rhampholeon maspictus BRANCH, BAYLISS & TOLLEY, 2014

Mount Mabu Pygmy Chameleon

German: Mount-Mabu-Zwergchamäleon

Rhampholeon maspictus Photo credit: Werner Conradie

Morphology

Snout-vent length: max. 65.2 mm; total length: max. 85.3 mm.

Rhampholeon maspictus is an unusually colorful species. The body, tail and limbs are leaf-green. The crest is marked with flecking and is slightly darker at all. On the lateral body parts, conspicuous light blue colored pattern elements exist, interspersed with two narrow diagonal yellow-green bands. The blue coloration extends to the head where it becomes more intense. The snout and gular region is dirt yellow. It has a bright yellow ring around the eye. The rostral appendage and tubercular scales are not very pronounced. There is a strong sexual dichromatism as its name (*maspictus* = colored male) indicates. Females are much less colorful; they are predominantly brownish.

Geographic distribution, Habitat

Mount Inago, Zambézia Province, Mozambique.

Type locality: surrounding of Forest Base camp in Mount Mabu, Zambézia Province, Mozambique, (16°17'10.1"S, 36°24'02.2"E), at 967 m asl.

This species inhabits the remnants of rainforest in Monte Mabu. Most likely, the individuals sit on the understory vegetation and occasionally descend to the ground, as many *Rhampholeon* species do.

Conservation status and main threats

CITES Appendix II since 2016 (CoP17 Proposal 27, 28).

EU Regulation 2017/160 [EG] Annex: B.

In Germany strictly and particularly protected under BNatSchG [BG] Status: b.

IUCN- Red List status: NT – Near Threatened (assessed august 2014).

Mount Mabu is a protected area, therefore no acute threat is known. However, the area could be under threat, due to uncontrolled logging as occurs in northern parts of Mozambique.

Reproduction

Reproduction	Oviparous
Litter size	7 round eggs (3 in the right oviduct and 4 in the left one) were detected in an allotype female

Husbandry and captive breeding X

No keeping of the species is known.

References

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Author: Christian Langner **27.07.2019**

Rhampholeon moyeri MENEGON, SALVIDIO & TILBURY, 2002

Moyer's pygmy chameleon, Udzungwa pygmy chameleon

German: Moyers Zwergchamäleon

Rhampholeon moyeri Photo Credit: Wolfgang Schmidt

Morphology

Snout-vent length: 64 mm max.; total length: 62 mm.

Rhampholeon moyeri has the characteristic leaf body shape of the genus. The ground color is brown to light brown, often with two dark crossbands. Few individuals are light yellowish or pale green. The helmet is rather flat with an inconspicuous crest. The most characteristic morphological trait is the rostral appendage that is curved slightly downwards.

Geographic distribution, Habitat

The species occurs in Udzungwa Mountains in Tanzania.

Type Locality: steep slopes in Udzungwa protected forest (Luhega), Kihanga Valley, Udzungwa Mountains, Southeast Tanzania.

Conservation status and main threats

CITES Appendix II since 2016 (CoP17 Proposal 27, 28).

EU Regulation 2017/160 [EG] Annex: B.

In Germany strictly and particularly protected under BNatSchG [BG] Status: b.

IUCN- Red List status: LC – Least Concern (assessed 28 August 2013).

Reproduction

Secondary sexual traits	In ♂♂ the post cloacal region is visibly swollen. ♂♂ are slightly smaller than ♀♀
Reproduction	Oviparous
Life expectancy in captivity	Less than a year. They die after laying the clutch (both in terrarium and in the wild)
Clutch size (Min. – Max.)	8 - 23
Clutch/ year	1
Incubation period	Temperature dependent, ca. 90 days
Incubation temperature	18 - 21 °C
Hatching rate	> 90 %
Maturity reaching rate	Few individuals that will not reproduce. Probably due to the lack of stimulus
F2 Generation bred	No
Offspring size / weight	Ca. 2 cm
Sperm storage	Yes
Sex ratio at hatching	Incubation at room temperature: ca. 1:1. No evidence of TSD

Husbandry and captive breeding 

Trigger for reproduction (e.g. technical equipment, care, social and climatic conditions)	The species has a similar life cycle as *Furcifer labordi.* The females lay their clutch during the dry season, and hatchlings hatch in the rainy season
Keeping difficulty	They can be kept in a vegetation semi humid terrarium with daily temperatures between 18 and 22 °C and lower temperature at night. Terrarium should be misted daily. Feeding every two days with invertebrates, supplemented with vitamins and minerals. Neon tubes and daily UV radiation should be used for lightening

General characteristics, difficulties with keeping and breeding	They can be kept in pairs, as long as the terrarium size is 30 x 40 x 40 cm. Males and sometimes females are not compatible to each other
Care of the young, technical and time effort	It is possible to keep youngs of the same clutch together in a relatively moist terrarium. For lightening neon tubes with UV radiation regulated with a timer should be used for 1 h daily. Additionally, daily works includes feeding and misting
Breeding difficulty evaluation	Very difficult
Frequency of breeding in captivity	Rarely
Number of evaluated questionnaires/interviewed persons (private person/zoological institutions/commercial breeders)	1 (private)

References

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Author: Christian Langner **27.07.2019**

Rhampholeon nchisiensis (LOVERIDGE, 1953)

South African Stumptail Chameleon, Nchisi Pygmy Chameleon, Pitless Pygmy-Chameleon
German: Nchisi-Mountain-Zwergchamäleon

Rhampholeon nchisiensis Photo Credit: Wolfgang Schmidt

Morphology

Snout-vent length: max. 43 mm; total length: max. 85 mm.

Like all other *Rhampholeon* species, it has the characteristic leaf body shape of the genus. The ground color ranges from slate grey to pale lemon yellow. The region around the eye can be mottled intensely blue. A prominent spiny superciliary crest and a small rostral appendix are present.

Geographic distribution, Habitat

The species occurs in Malawi at 1500 m and in Tanzania at 1800 m asl.

Type locality: Nchisi Mountains, Malawi, at 1524 m asl.

Conservation status and main threats

CITES Appendix II since 2016 (CoP17 Proposal 27, 28).

EU Regulation 2017/160 [EG] Annex: B.

In Germany strictly and particularly protected under BNatSchG [BG] Status: b.

IUCN- Red List status: LC - Least Concern (assessed 26 August 2013).

Reproduction

Secondary sexual traits	The tail is longer in ♂♂ in than in ♀♀; ♀♀ are larger than ♂♂; ♂♂ appear more rugose
Sexual maturity	with 9 months
Reproduction	Oviparous
Longevity in captivity	1 - 3 years
Hatching season	March / April
Clutch size (Min. – Max.)	6 - 18
Clutch / year	3 - 5
Incubation period	Temperature dependent, between 50 and 90 days
Incubation temperature	18 - 21 °C
Hatching rate	> 90 %
Maturity reaching rate	Ca. 80 %
F2 Generation bred	Yes
Offspring size / weight	2 cm
Sperm storage	Yes
Sex ratio at hatching	Incubation at room temperature: ca. 1:1. No evidence of TSD

Husbandry and captive breeding 

Trigger for reproduction (e.g. technical equipment, care, social and climatic conditions)	Difficult to assess in terrarium. Likely due to changing the dry and rainy season. It does not hibernate
Keeping difficulty	They can be kept in a vegetation rich humid terrarium with daily temperature of maximum 21 °C and significant night setback. Terrarium should be misted daily. Feeding every two days with invertebrates, supplemented with vitamins and minerals. Neon tubes and daily UV radiation should be used for lightening
General characteristics, difficulties with keeping and breeding	They can be kept in pairs, as long as the terrarium size is 30 x 40 x 40 cm. Also keeping of 1.2 is possible. Males are not compatible together
Care of the young, technical and time effort	Easily maintained in small groups in small moist terrariums. For lightening, neon tubes with UV radiation regulated with a timer should be used for 1 h daily. Additionally, daily works includes feeding and misting

Breeding difficulty evaluation	Intermediate, in comparison with other species of the genus
Frequency of breeding in captivity	Rather infrequent
Number of evaluated questionnaires/interviewed persons (private person/zoological institutions/commercial breeders)	1 (private)

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Author: Christian Langner **27.07.2019**

Rhampholeon nebulauctor Branch, Bayliss & Tolley, 2014

Mount Chiperone Pygmy Chameleon

German: Mount-Chiperone-Zwergchamäleon

Rhampoleon nebulauctor Photo Credit: Werner Conradie

Morphology

Snout-vent length: max. 48.9 mm; total length: max. 62 mm.

The ground color of *Rhampholeon nebulauctor* is mottled brown or green. It has two wide, dark diagonal bands on the flanks. The head, neck and forelimbs can be bright green. The gular region is often bright blue. The venter of the back limbs and the tail is reddish orange. Females are eventually larger than males. Males have a more pronounced rostral appendix than females.

Geographic distribution, Habitat

Mount Chiperone, Zambézia Province, Mozambique.

Type locality: understory vegetation in evergreen forest on the southeastern slopes of Mount Chiperone, Zambézia Province, Mozambique (16°30'25.9"S, 35°43'33.4"E), at ca. 1000 m asl.

Conservation status and main threats

CITES Annex II since 2016 (CoP17 Proposal 27, 28).

EU Regulation 2017/160 [EG] Annex: B.

In Germany strictly and particularly protected under BNatSchG [BG] Status: b.

IUCN- Red List status: VU – Vulnerable D2 (assessed 13 august 2014).

Reproduction

Reproduction	Oviparous
Litter size	All three females of the type series had 2 - 4 undeveloped eggs in their oviducts in November / December

Husbandry and captive breeding X

No keeping of the species is known.

References

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Author: Christian Langner **27.07.2019**

Rhampholeon platyceps GÜNTHER, 1893

Mount Mulanje Pygmy Chameleon; Malawi Stumptail Chameleon

German: Mount-Mulanje-Zwergchamäleon

Rhampholeon platyceps Photo credit: Wolfgang Schmidt

Morphology

Snout-vent length: max. 70 mm; total length: max. 100 mm.

Like all other *Rhampholeon* species, it has the characteristic leaf body shape of the genus. The ground color is a mixture of brown and grey. The brow crest has horn-like tubercles. A subspecies has been described as *Rhampholeon platyceps carri* that differs from the nominal form in lacking the rostral appendage of the nominate form and the tubercles at the brow crest.

Geographic distribution, Habitat

Rhampholeon platyceps is confirmed to occur in the Shire Mountains of Malawi and at Namuli Massif in Mozambique.

Type locality: Shire Highlands, south of Nyassa Lake, at Mount Zomba and Monut Milanje, Nyassaland, Malawi. Terra typica restricta (fide STEVENS 1974: 13): Mulanje Mountain, Malawi.

Conservation status and main threats

CITES Appendix II since 2016 (CoP17 Proposal 27, 28).

EU Regulation 2017/160 [EG] Annex: B.

In Germany strictly and particularly protected under BNatSchG [BG] Status: b.

IUCN- Red List status: EN – Endangered B1ab(ii,iii,v)+2ab(ii,iii,v) (assessed 26 August 2013).

Reproduction

Secondary sexual traits	The tail is longer in ♂♂ than in ♀♀
Reproduction	Oviparous
Sexual maturity	Ca. 18 months
Longevity in captivity	2 - 3 years
Clutch size (Min. – Max.)	2 - 3 eggs
Clutch/ year	2
Incubation period	Temperature dependent between 70 and 90 days
Incubation temperature	16 - 20 °C
Hatching rate	> 50 %
Maturity reaching rate	Ca. 50 %
F2 Generation bred	No, F1 did not reproduce
Offspring size	Ca. 2 cm
Sex ratio at hatching	Incubation at room temperature, ca. 1:1. No evidence of TSD

Husbandry and captive breeding

Keeping difficulty	They inhabit low vegetation in highlands. They can be kept in a vegetation rich, moist terrarium with daily temperature of maximum 21 °C, distinctively lower at night. Water should be daily sprayed, and terrarium should be misted daily. Feeding every two days with invertebrates, supplemented with vitamins and minerals. Neon tubes and daily UV radiation should be used for lightening
General characteristics, difficulties with keeping and breeding	They can be kept in pairs, as long as the terrarium size is 30 x 40 x 40 cm
Care of the young, technical and time effort	It is possible to keep juveniles in small groups in a moist small terrarium. For lightening, neon tubes with UV radiation regulated with a timer should be used for 1 h daily. Additionally, daily works includes feeding and misting

Breeding difficulty evaluation	Very difficult
Frequency of breeding in captivity	Just a few individuals have ever been imported into Germany
Number of evaluated questionnaires/interviewed persons (private person/zoological institutions/commercial breeders)	1 (private)

References

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Author: Christian Langner **27.07.2019**

Rhampholeon spectrum (BUCHHOLZ, 1874)

Cameroon Stumptail Chameleon

German: Kamerun-Zwergchamäleon

Rhampholeon spectrum Photo credit: Wolfgang Schmidt

Morphology

Snout-vent length: max. 61 mm; total length: 90 mm.

Like most other *Rhampholeon* species, it shows the characteristic leaf body shape of the genus. The ground color ranges from brown, grey-brown to red and black-brown. They can be either uniformly colored or mottled in a lichen-shaped pattern. They have two to three thin dorsolateral black crossbands running along the flanks. The venter is always lighter colored. A small, cone-shaped rostral appendix occurs in this species.

Geographic distribution, Habitat

Rhampholeon spectrum occurs in Cameroon, Democratic Republic of Congo, Equatorial Guinea (Bioko Island), the Central African Republic and Gabon.

Type locality: Limbé and Bonjongo, Cameroon. Determined for Bojongo by MERTENS (1938).

Conservation status and main threats

CITES Appendix II since 2016 (CoP17 Proposal 27, 28).

EU Regulation 2017/160 [EG] Annex: B.

In Germany strictly and particularly protected under BNatSchG [BG] Status: b.

IUCN- Red List status: LC – Least Concern (assessed 30 June 2009).

Reproduction

Secondary sexual traits	In ♂♂ the post cloacal region is visibly swollen
Sexual maturity	With 12 months
Reproduction	Oviparous
Lifespan in captivity	2 - 4 years
Clutch size (Min. – Max.)	Always 2 eggs
Clutch/ year	3
Incubation period	Temperature dependent between 120 and 180 days
Incubation temperature	18 - 23 °C, dependent on the place of origin
Hatching rate	Ca. 100 %
Maturity reaching rate	80 %
F2 Generation bred	Yes
Offspring size	Ca. 2.5 cm
Sperm storage	Yes
Sex ratio at hatching	Incubation at room temperature, ca. 1:1. No evidence of TSD
Amphigonia retardata (sperm storage)	Yes
Parthenogenesis	Should be possible

Husbandry and captive breeding 

Trigger for reproduction (e.g. technical equipment, care, social and climatic conditions)	Changes between rainy and dry season. Frequent water spraying can work as a trigger. It does not hibernate
Keeping difficulty	They can be kept in a vegetation rich humid terrarium with daily temperatures between 20 and 24 °C, at room temperature at night. Terrarium should be misted daily. Feeding every two days with invertebrates, supplemented with vitamins and minerals. Neon tubes and daily UV radiation should be used for lightening

General characteristics, difficulties with keeping and breeding	They can be kept in pairs, as long as the terrarium size is 30 x 40 x 40 cm. Males and sometimes females are not compatible to each other
Care of the young, technical and time effort	It is possible to keep youngs of the same clutch together in a semi-humid terrarium. For lightening, neon tubes with UV radiation regulated with a timer should be used for 1 h daily. Additionally, daily works includes feeding and misting
Breeding difficulty evaluation	Relatively easy. However, due to their relatively short lifespan, long incubation period and small clutch-size, long term breeding is rather difficult. Several individuals are constantly needed for a successful continuous breeding
Frequency of breeding in captivity	Frequent breeding at the beginning because lizards were often imported. Today, the species is more rare in captivity
Number of evaluated questionnaires/interviewed persons (private person/zoological institutions/commercial breeders)	2 (1private; 1 Institution)

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Author: Christian Langner **27.07.2019**

Rhampholeon spinosus (MATSCHIE, 1892)

Rosette-nosed Pygmy Chameleon, Usambara Spiny Pygmy Chameleon

German: Stacheliges Zwergchamäleon

Rhampholeon spinosus Photo credit: Wolfgang Schmidt

Morphology

Snout-vent length: 51 mm. Total length: 87 mm.

The body shape of *Rhampholeon spinosus* is different from the typical leaf shape form of most of the other *Rhampholeon* species.

With its lichen-like coloration and body shape, the species mimics a branch. A characteristic trait is the dominant plate shaped, rostral appendix. It has a prominent helmet that bends upward in the nuchal region. As suggested by the scientific name, this pygmy chameleon has a very spiny body. There are spiny tubercular scales along the crest and smaller ones on the limbs, below the throat, along the flanks and all over the tail. The ground color is very variable ranging from brown, grey to green shades. Some individuals have turquois flecking on the head and neck.

Rhampholeon spinosus was included in the genus *Chamaeleo* for a long time, until KLAVER & BÖHME (1986) classified it in the genus *Bradypodion*. It was in 2004, that TILBURY & MARIAUX included it in the genus *Rhampholeon.*

Geographic distribution, Habitat

Rhampholeon spinosus occurs in Usambara Mountains in Tanzania at 700 - 1500 m asl. It is rather uncommon species inhabiting the perennial layer of afro-temperate forests. Sometimes individuals were observed in bushes, perched at heights up to 2 - 3 m.

Type Locality: Derema, Usambara Mountains, Tanzania.

Conservation status and main threats

CITES Annex II since 1977 (as *Bradypodion spinosum*, transfer to *Rhampholeon* by TILBURY & MARIAUX, 2004).

EU Regulation 2017/160 [EG] Annex: B.

In Germany strictly and particularly protected under BNatSchG [BG] Status: b.

IUCN- Red List status: EN – Endangered B1ab(ii,iii) (assessed 27 August 2013).

The main threat for the species is habitat change and habitat loss due to deforestation.

Reproduction

Secondary sexual traits	The rostral appendage in ♂♂ is bigger than in ♀♀. ♂♂ seem to be more spinose than ♀♀
Reproduction	Oviparous
Sexual maturity	With 18 months
Hatching season	March / April
Clutch size (Min. – Max.)	2 - 6
Clutch/ year	2 - 3
Incubation period	Temperature dependent between 35 and 70 days
Incubation temperature	18 - 23 °C
Hatching rate	> 50 %
Maturity reaching rate	Ca. 50%
F2 Generation bred	Yes
Offspring size	2 cm
Sperm storage	Yes
Sex ratio at hatching	During incubation at room temperature ca. 1:1. No evidence of TSD

Husbandry and captive breeding

Trigger for reproduction (e.g. technical equipment, care, social and climatic conditions)	Difficult to assess in terrarium, but possibly the changes between rainy to dry season. It does not hibernate
Keeping difficulty	They can be kept in a vegetation rich, moist terrarium with a temperature of 25 °C during the day, at room temperatures at night. Terrarium should be misted daily. Feeding every two days with invertebrates, supplemented with vitamins and minerals. Neon tubes and daily UV radiation should be used for lightening
General characteristics, difficulties with keeping and breeding	It is recommended to keep them individually in terrariums of minimum 30 x 40 x 40 cm. It is also possible to keep them in pairs, but they should be monitored and separated if necessary
Care of the young, technical and time effort	Easily maintained in small groups in small moist terrariums. For lightening, neon tubes with UV radiation regulated with a timer should be used for 1 h daily. Additionally, daily work includes feeding and misting
Breeding difficulty evaluation	Rather difficult, due to the cool temperatures required
Frequency of breeding in captivity	Rather infrequent
Number of evaluated questionnaires/interviewed persons (private person/zoological institutions/commercial breeders)	1 (private)

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Author: Christian Langner **13.08.2019**

Rhampholeon temporalis (MATSCHIE, 1892)

Usambara Stumptail Chameleon, East Usambara Pygmy Chameleon

German: Usambara-Zwergchamäleon

Rhampholeon temporalis Photo credit: Wolfgang Schmidt

Morphology

Snout-vent length: max. 50 mm; total length: 80 mm.

Like other *Rhampholeon* species, *Rhampholeon temporalis* has the characteristic leaf body shape of the genus. The ground color is light brown and grey. The head region is darker. The venter is lighter in color than the dorsum. The tip of the rostral appendix is slightly widened reminding the beak of a duck.

Geographic distribution, Habitat

Today, there is only evidence that it occurs in the Usambara Mountains in Tanzania, up to 1400 m asl.

Type Locality: Derema, Usambara Mountains, Tanzania.

Conservation status and main threats

CITES Appendix II since 2016 (CoP17 Proposal 27, 28).

EU Regulation 2017/160 [EG] Annex: B.

In Germany strictly and particularly protected under BNatSchG [BG] Status: b.

IUCN- Red List status: EN – Endangered B1ab(iii)+2ab(iii) (assessed 27 August 2013).

Reproduction

Secondary sexual traits	In ♂♂ the post cloacal region is visibly swollen. ♂♂ have longer tails than ♀♀
Reproduction	Oviparous
Life expectancy in captivity	1 - 3 years
Clutch size (Min. – Max.)	Always 2 eggs
Clutch/ year	3 - 5
Incubation period	Temperature dependent 70 - 90 days
Incubation temperature	18 - 23 °C
Hatching rate	> 90 %
Maturity reaching rate	Ca. 80 %
F2 Generation bred	Yes
Offspring size	Ca. 2.5 cm
Sperm storage	Yes
Sex ratio at hatching	Incubation at room temperature: ca. 1:1. No evidence of TSD

Husbandry and captive breeding

Trigger for reproduction	Change between rain and dry season. Frequent water spraying can work as a trigger. It does not hibernate
Keeping difficulty	They can be kept in a vegetation rich, moist terrarium with daily temperatures between 20 and 24 °C, at room temperature at night. Terrarium should be misted daily. Feeding every two days with invertebrates, supplemented with vitamins and minerals. Neon tubes and daily UV radiation should be used for lightening
General characteristics, difficulties with keeping and breeding	They can be kept in pairs, as long as the terrarium size is 30 x 40 x 40 cm. Males and sometimes females are not compatible to each other
Care of the young, technical and time effort	It is possible to keep juveniles of the same clutch together in a relatively moist terrarium. For lightening, neon tubes with

	UV radiation regulated with a timer should be used for 1 h daily. Additionally, daily work includes feeding and misting
Breeding difficulty evaluation	Relatively easy. However, due to their relatively short lifespan, long incubation period and small clutch size, long term breeding is rather difficult. Several individuals are constantly needed for a successful continuous breeding
Frequency of breeding in captivity	Frequent breeding when they were imported frequently. Nowadays, the species is becoming rare in captivity
Number of evaluated questionnaires/interviewed persons (private person/zoological institutions/commercial breeders)	1 (private)

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Author: Christian Langner **27.07.2019**

Rhampholeon tilburyi BRANCH, BAYLISS & TOLLEY, 2014

Mount Namuli Pygmy Chameleon

German: Mount-Namuli-Zwergchamäleon

Rhampholeon tilburyi Photo credit: Werner Conradie

Morphology

Snout-vent length: max. 55.3 mm; total length: max. 70 mm.

Rhampholeon tilburyi has a leaflike body shape as most of the *Rhampholeon* species. The ground color of *Rhampholeon tilburyi* is beige to dark brown. It has two dark parallel diagonal bands on the body flanks. Orange-brown color elements could also occur along the flanks. Females eventually larger than males. The males have a more pronounced rostral appendix than females.

Geographic distribution, Habitat

The species occurs in Mount Namuli, Zambézia Province, Mozambique.

Type locality: Ukalini forests nestled on the southern flank of the main peak. Namuli Massif, Zambézia Province, Mozambique (no southern coordinates are given, 15°22'S 37°04'E), at ca. 1550 m asl.

Conservation status and main threats

CITES Annex II since 2016 (CoP17 Proposal 27, 28).

EU Regulation 2017/160 [EG] Annex: B.

In Germany strictly and particularly protected under BNatSchG [BG] Status: b.

IUCN- Red List status: CR – Critically Endangered B1ab(iii,v) (assessed 13 August 2014).

Reproduction

Reproduction	Oviparous
Litter size	The female holotype contained 7 spherical eggs in its oviduct

Husbandry and captive breeding X

No keeping of the species is known.

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Author: Christian Langner **27.07.2019**

Rhampholeon uluguruensis TILBURY & EMMRICH, 1996

Uluguru pygmy chameleon
German: Uluguru-Zwergchamäleon

Rhampholeon uluguruensis Photo credit: Wolfgang Schmidt

Morphology

Snout-vent length: 40 mm; total length: 50 mm.

The ground color of *Rhampholeon uluguruensis* is a marbled brown or green, which is intermittent from two broad dark collard stripes on the flanks. Region of the head, nape and frontal limps are often bright green, the chin is often bright blue. The surface of the hind limbs and tail is reddish orange. Females are eventually larger than males. Frontal appendix of the male is much more dominant.

Geographic distribution, Habitat

The species is endemic to the Uluguru Mountains in Tanzania. *Rhampholeon uluguruensis* lives in the herbal layer of evergreen montane forests, in altitudes between 1500 and 1700 m.

Type locality: Bondwa Summit, Uluguru Mountains, Morogoro district, Tanzania, at 1650 m.

Conservation status and main threats

CITES Appendix II since 2016 (CoP17 Proposal 27, 28).

EU Regulation 2017/160 [EG] Annex: B.

In Germany strictly and particularly protected under BNatSchG [BG] Status: b.

IUCN- Red List status: LC – Least Concern (assessed 26 August 2013).

Reproduction

Reproduction	Oviparous
Litter size	3

Husbandry and captive breeding X

Nothing is known about breeding and captive husbandry of this species.

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Author: Christian Langner **27.07.2019**

Rhampholeon viridis MARIAUX & TILBURY, 2006

Green Pygmy Chameleon, Pare Pygmy Chameleon

German: Grünes Zwergchamäleon

Rhampholeon viridis Photo credit: Wolfgang Schmidt

Morphology

Snout-vent length: 38 - 47 mm; total length: 63 - 89 mm.

Rhampholeon viridis has small spinelike scales on the crest, but not on the head. The rostral appendix appears just as a small swelling. The tail in females is shorter than in males. The ground coloration of males is emerald-green. Specimens of the northern Pare region are red-rust flecked on the head and body. The species is morphologically similar to *R. temporalis* and is certainly distinguished only by hemipenes ornamentation.

Geographic distribution, Habitat

South of Pare Mountain, Tanzania.

Type locality: Tanga Region, south of Pare Mountain. It occurs in remnants of forest near the Hingili river, north of Shengena Mountain (4°14' 50" S, 37°59'28" E), at 1450 m asl.

This species is confined to be common in afro-temperate mountain forests, where it is found at forest edges. However, the habitat of this species has been extremely degraded and transformed.

Conservation status and main threats

CITES Appendix II since 2016 (CoP17 Proposal 27, 28).

EU Regulation 2017/160 [EG] Annex: B.

In Germany strictly and particularly protected under BNatSchG [BG] Status: b.

IUCN- Red List status: EN - Endangered B1ab(ii,iii)+2ab(ii,iii) (assessed 21 August 2013).

The main threat is habitat loss and degradation. In addition, the species is collected for the pet trade.

Reproduction

Secondary sexual traits	The tail is longer in ♂♂ than in ♀♀
Sexual maturity	With 18 months
Reproduction	Oviparous
Mating season	Late summer / autumn
Hatching season	March / April
Clutch size (Min. – Max.)	3 - 8
Clutch / year	2
Incubation period	Temperature dependent between 77 and 113 days
Incubation temperature	18 - 20 °C
Hatching rate	> 50 %
Maturity reaching rate	Ca. 66 %
F2 Generation bred	Yes
Offspring size	No data
Sperm storage	Yes
Sex ratio at hatching	Incubation at room temperature: ca. 1:1. No evidence of TSD

Husbandry and captive breeding

Trigger for reproduction (e.g. technical equipment, care, social and climatic conditions)	Changing between rainy and dry season. It does not hibernate
Keeping difficulty	They can be kept in a vegetation rich, moist terrarium with daily temperatures of maximum 21 °C lowering at night. Terrarium should be misted daily. Feeding every two days with invertebrates, supplemented with vitamins and minerals.

	Neon tubes and daily UV radiation should be used for lightening
General characteristics, difficulties with keeping and breeding	They can be kept in pairs, as long as the terrarium size is 30 x 40 x 40 cm
Care of the young, technical and time effort	It is possible to keep juveniles in small groups in a moist terrarium. For lightening, neon tubes with UV radiation regulated with a timer should be used for 1 h daily. Additionally, daily work includes feeding and misting
Breeding difficulty evaluation	Rather difficult, due to the cool temperature requirements
Frequency of breeding in captivity	Rather infrequent
Number of evaluated questionnaires/interviewed persons (private person/zoological institutions/commercial breeders)	1 (private)

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Author: Christian Langner **21.08.2019**

Rieppeleon brachyurus (GÜNTHER, 1893)

Beardless Pygmy Chameleon, Zomba Pygmy Chameleon

German: Stummelschwanzchamäleon

Rieppeleon brachyurus Photo credit: Wolfgang Schmidt

Morphology

Snout-vent length: 50 mm; total length: 58 mm.

Rieppeleon brachyurus has a laterally compressed, leaf-shaped body shape. It is by far the smalest *Rieppeleon* species. Brown to fawn colors prevail in body coloration, even yellowish pigmentation could be present. According to its arousal stage, a more or less distinct lateral stripe runs from eye to tail. An important feature distinguishing from both other species in the genus is the complete lacking of any kind of “bearded” appendages at the chin resulting in the common English name.

Rieppeleon brachyurus was formerly placed in the genus *Rhampoleon* and *Brookesia*, before MATTHEE, TILBURY & TOWNSEND (2004) erected the new genus *Rieppeleon*.

Geographic distribution, Habitat

Rieppeleon brachyurus occurs in Malawi, Mozambique and southeast Tanzania. The habitat is described as Miombo-forest and adjacent grass savanna. In Malawi, the species also occurs in gallery forests. In Tanzania, it lives in submontanous forests on the Rondo plateau.

Type locality: Shiré Highlands, south of Lake Nyassa, principally upon Mount Zomba and Mount Milanje, Nyassaland (= Malawi).

Conservation status and main threats

CITES Annex II since 2016 (CoP17 Proposal 27, 28).

EU Regulation 2017/160 [EG] Annex: B.

In Germany strictly and particularly protected under BNatSchG [BG] Status: b.

IUCN- Red List status: CR – Critically endangered B1ab(iii,v) (assessed 21 August 2013).

Reproduction

Secondary sexual traits	Tail of ♂♂ longer than tail of ♀♀; ♂♂ smaller at all
Sexual maturity	With 6 months
Reproduction	Oviparous
Mating season	March / April
Litter size (Min. – Max.)	2 - 5
Clutch / year	2 - 3
Incubation period	Temperature dependent between 50 and 70 days
Incubation temperature	20 - 24 °C
Hatching rate	> 90 %
Maturity reaching rate	Ca. 80 %
F2 generation bred	Yes
Offspring size	2 cm
Sperm storage	Yes
Sex ratio at hatching	Incubation at room temperature 1:1. No evidence of TSD

Husbandry and captive breeding

Trigger for reproduction	Changes between the rainy and dry season. It does not hibernate
Keeping requirements	Inhabitant of grass savanna. These lizards could be kept in a densely planted, humid terrarium at daytime temperatures of maximum 25 °C and night setback. The terrarium should be misted daily. The animals should be fed every second day with small supplemented invertebrates. The terrarium should be lightened with neon tubes. A slightly UV-emitting neon bulb should be used additionally
General characteristics, difficulties with keeping and breeding	They can be kept in pairs, as long as the terrarium size is 30 x 40 x 40 cm, or in groups of 1.2 or 1.3

Care of the young, technical and time effort	For small groups in small moist terrariums, it is recommended to use neon tubes with 1 h daily UV radiation regulated with a timer. Additionally, feeding and spraying is needed
Breeding difficulty evaluation	Breeding success is easy, even for beginners. The problem of a continuous breeding is the short live period of this species. A larger amount of stock animals is needed
Frequency of breeding in captivity	Breeding occurs rarely, because only few specimens have been imported in the past to Germany and captive stock is small
Number of evaluated questionnaires	1 (private)

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Author: Christian Langner **22.08.2019**

Rieppeleon brevicaudatus (MATSCHIE, 1892)

Bearded Pygmy Chameleon, Short-Tailed Pygmy Chameleon

German: Stummelschwanzchamäleon

Rieppeleon brevicaudatus Photo credit: Wolfgang Schmidt

Morphology

Snout-vent length: 75 mm; total length: 94 mm.

Rieppeleon brevicaudatus has a lateral compressed leaf-shaped body shape.

Brown to gray and ochre colors prevail in body coloration. Even yellowish, greenish and redish pigmentation could be present. According to its arousal stage, more or less distinct stripe and spots could be present. An important distinguishing feature to *R. brachyurus* is the presence of „bearded" appendages at its chin. This results in the common English name „Bearded Pygmy Chameleon".

Rieppeleon brevicaudatus was formerly placed in the genus *Rhampoleon* and *Brokesia*, before MATTHEE, TILBURY & TOWNSEND (2004), erected the genus *Rieppeleon*.

Geographic distribution, Habitat

Rieppeleon brachyurus occurs in eastern Tanzania and Kenya. The habitat is described as submontane forest like the Usambara and Ulugurus in the eastern Arc Mountains.

It occurs in altitudes of 1200 - 1500 m.

Type locality: Derema, Usambara Mountains, Tanzania.

Conservation status and main threats

CITES Annex II since 2016 (CoP17 Proposal 27, 28).

EU Regulation 2017/160 [EG] Annex: B.

In Germany strictly and particularly protected under BNatSchG [BG] Status: b.

IUCN- Red List status: CR – Critically endangered B1ab(iii,v) (assessed 21 August 2013).

Reproduction

Secondary sexual traits	Tail of ♂♂ longer than tail of ♀♀
Sexual maturity	After 6 months
Reproduction	Oviparous
Mating season	March / April
Litter size (Min. – Max.)	2 - 9
Clutch/ year	3 - 5
Incubation period	Temperature dependent between 30 and 70 days
Incubation temperature	18 - 25 °C
Hatching rate	> 90 %
Maturity reaching rate	Ca. 80 %
F2 generation bred	Yes
Offspring size	2 cm
Sperm storage	Yes
Sex ratio at hatching	Incubation at room temperature 1:1. No evidence of TSD

Husbandry and captive breeding 

Trigger for reproduction	Change between the rain and dry season. It does not hibernate
Keeping requirements	Inhabitant of grass savanna. These lizards could be kept in a densely planted, humid terrarium at daytime temperatures of maximum 25 °C and night setback. The terrarium should be misted daily. The animals should be fed every second day with small supplemented invertebrates. The terraria should be lightened with neon tubes. A slightly UV-emitting neon bulb should be used additionally
General characteristics, difficulties with keeping and breeding	They can be kept in pairs, as long as the terrarium size is 30 x 40 x 40 cm, or in groups of 1.2 or 1.3. Males are aggressive among each other

Care of the young, technical and time effort	Easy to maintain in small groups in small moist terrariums. It is recommended to use neon tubes with 1 h daily of UV radiation regulated with a timer. Additionally, feeding and spraying
Breeding difficulty evaluation	Breeding succes is easy even for beginners. The problem of a continuous breeding is the short live period of the species. A larger amount of stock animals is needed
Frequency of breeding in captivity	The species was common in captivity when it was regularly imported. Nowadays captive stock is small and breeding occurs more rarely
Number of evaluated questionnaires/interviewed persons (private person/zoological institutions/commercial breeders)	1 (private)

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Author: Christian Langner **22.08.2019**

Rieppeleon kerstenii (PETERS, 1868)

Kenya Stumptail Chameleon, Pygmy Grass Chameleon

German: Somali-Stummelschwanzchamäleon

Rieppeleon kerstenii Photo credit: Wolfgang Schmidt

Morphology

Snout-vent length: 71 mm; total length: 100 - 120 mm.

Fawn colors prevail in body coloration. Especially in males, a brown-orange pigmentation could be present. According to its arousal stage, more or less distinct stripe could be present.

The predominantly homogeneous scalation of *Rieppeleon kerstenii* is irregularly interfused with enlarged tubercle scales. They are predominantly present on both sides of the dorsal crest, on the limbs, eyelids, and along the ventral fringe. On the throat, they form very distinct rows. This chin-crest distinguishes the species clearly from both congeners.

Rieppeleon kerstenii was formerly placed in the genus *Rhampoleon* and *Brokesia*, before MATTHEE, TILBURY & TOWNSEND (2004) erected the genus *Rieppeleon*.

Next to the nominate form the subspecies *Rieppeleon kerstenii robecchii* (BOULENGER 1891) was described.

Geographic distribution, Habitat

Rieppeleon kerstenii kerstenii occurs in northeast and east Kenya and east Tanzania.

Rieppeleon kerstenii robecchii occurs in Somalia, Äthiopia and northeast Kenya.

The species is much less specialized in its habitat preference than other dwarf chameleons of the genus *Rhampholeon* and *Rieppeleon*. *Rieppeleon kerstenii* occurs in a variety of habitats. It inhabits evergreen forests just as coastal scrubs, savanna and even semidesert regions.

Type locality of *R. k. kerstenii*: Wanga [=Vanga], bei Mombas (= Mombasa), Kenya.

Type locality of *R. k. robecchii*: “Wuorandi, near Obbia” [= Warandi, Somalia].

Conservation status and main threats

CITES Annex II since 2016 (CoP17 Proposal 27, 28).

EU Regulation 2017/160 [EG] Annex: B.

In Germany strictly and particularly protected under BNatSchG [BG] Status: b.

IUCN- Red List status: CR – Critically endangered B1ab(iii,v) (assessed 21 August 2013).

Reproduction

Secondary sexual traits	Tail of ♂♂ longer than tail of ♀♀; ♂♂ distinctly smaller and more slender
Sexual maturity	After 9 months
Reproduction	Oviparous
Mating season	March / April
Litter size (Min. – Max.)	2 - 9
Clutch/ year	3 - 5
Incubation period	Temperature dependent between 35 and 90 days
Incubation temperature	21 - 28 °C, it depends on the origin
Hatching rate	> 90 %
Maturity reaching rate	Ca. 80 %
F2 generation bred	Yes
Offspring size	2.5 cm
Sperm storage	Yes
Life expectancy	1 -3 years
Sex ratio at hatching	Incubation at room temperature 1:1. No evidence of TSD

Husbandry and captive breeding

Trigger for reproduction	Changes between the rain and dry season. It does not hibernate
Keeping requirements	Inhabitant of grass savanna. These lizards could be kept in a densely planted, humid terrarium at daytime temperatures of maximum 25 °C, and night setback. The terrarium should be misted daily. The animals should be fed every second day with small supplemented invertebrates. The terrarium should be lightened with neon tubes. A slightly UV-emitting neon bulb should be used additionally
General characteristics, difficulties with keeping and breeding	They can be kept in pairs, as long as the terrarium size is 30 x 40 x 40 cm, or in groups of 1.2 or 1.3. Males are aggressive among each other
Care of the young, technical and time effort	Easy to maintain in small groups in small moist terrariums. It is recommended to use neon tubes with UV radiation 1 h daily, regulated with a timer. Additionally, feeding and spraying
Breeding difficulty evaluation	Breeding succes is easy, even for beginners. The problem of a continuous breeding is the short live period of the species. A larger amount of stock animals is needed
Frequency of breeding in captivity	Just a few specimens were imported into Germany in the past. Nowadays, breeding occurs rarely because captive stock is small
Number of evaluated questionnaires/interviewed persons (private person/zoological institutions/commercial breeders)	1 (private)

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Author: Christian Langner **22.08.2019**

Gekkonidae

Cnemaspis psychedelica GRISMER, NGO & GRISMER, 2010

Psychedelic Rock Gecko
German: Psychedelischer Felsengecko
Vietnamesisch: Tac ke duoi vang

Cnemaspis psychedelica / Allwetterzoo Münster Photo credit: Christian Langner

Morphology

Snout-vent length: 75 mm; total length: 160 mm maximum.

The head is green-yellow becoming intense yellow with black bands toward the nuchal region. The ground color of the dorsum and the limbs up to the joints is bright purple. Feet and tail are bright orange.

Depending on the light intensity in the terrarium the colors can change and become darker and less intense.

The lack of lamellae on the toe pads, the presence of claws, and the flattened body indicate their saxicolous adaption.

Geographic distribution, Habitat

Hon Khoai Island and Hon Tuong Island, in Rach Gia bay south of Can Mau Province, Vietnam. It is a saxicolous species and well adapted to granite formations in the rainforest.

Type locality: Hon Khoai Island, Ca Mau Province, Ngoc Hien District, Vietnam (08°26.098 N, 104°49.536 E).

Conservation status and main threats

CITES Annex I since 2016 (CoP17 Proposal 29).

EU Regulation 2017/160 [EG] Annex: B.

In Germany strictly and particularly protected under BNatSchG [BG] Status: b.

IUCN- Red List status: EN – Endangered B1ab(iii)+2ab(iii) (assessed 8 June 2016).

Due to the very small distribution area of 8 km² in Hon Khoai Island, and the even smaller neigbouring island Hon Tuong, as well as its strong association to granitic rock habitats, the species is especially vulnerable to anthropogenic interventions such as habitat destruction.

Reproduction

Secondary sexual traits	Subadult and adult males can be identified by their swollen cloacal region (where the hemipenes are located)
Sexual maturity	12 months, 16 cm TL
Reproduction	Oviparous
Mating season	Spring
Clutch size (Min. – Max.)	Mostly 2 eggs, rarely 1 egg; recent field research found that communal nesting sites in heights of 0.5 - 3.5 m are used
Clutch / year	4 - 5, from spring to autumn every 6 - 8 weeks; in the natural habitat clutches were recorded in November and January
Incubation period	55 - 90 days
Incubation temperature	24 - 32 °C (day time), 20 - 24 °C (night time)
Hatching rate	75 %
Maturity reaching rate	100 % (up to date data only available from a breeding pair that had 10 juveniles)
F2 Generation bred	Yes
Size/weight of the hatchlings	5 cm TL
Sex ratio at hatching	1:1 ratio (from the current data available) from incubation in terrarium with temperature variation

Husbandry and captive breeding

Trigger for reproduction (e.g. technical equipment, care, social and climatic conditions)	Cool period (22 - 26 °C day time; 20 - 22 C° night time) with reduced daylight of 8 h / day in winter. The increase in temperature and daylight in spring leads to mating and laying of eggs. The adults can be kept in pairs the whole year round
Keeping requirements	Relatively moist rain forest terrarium (40 x 30 x 60 cm; the width of the terrarium doesn't play an important role since they dwell on the walls) with rocky surface walls (saxicolous species). Moderate lighting, 35 W UVB MD-Lamp. Water spraying 2 x 10 seconds daily needed. A temperature gradient in the terrarium with 24 °C (below) to 36 °C (above) is needed. Bark pieces should be leaned on the walls to serve as shelter. Additionally, real plants can also serve as shelter. A calcium carbonate based supplement and water should always be available
General characteristics, difficulties with keeping and breeding	The eggs are glued on the surface, therefore are left inside the terrarium with the adults. As soon as the juveniles are hatched they should be removed from the terrarium. Although sometimes the juveniles stayed few days inside the terrarium with the adults, none was found to be eaten or bitten on the tail. Sometimes the eggs are laid exposed to extreme temperatures (below the lamps), which leaves room for improvement of the hatching rate. The shell of the eggs is very thick; therefore, the females need enough calcium carbonate. Please note that they move very fast, but can't climb on glass
Care of the young, technical and time effort	Should be kept individually in small terrariums or boxes which should be placed under neon tubes. The terrariums should be sprayed daily
Breeding difficulty evaluation	Breeding is easy for experienced gecko keepers
Frequency of breeding in captivity	Rarely
Number of evaluated questionnaires/interviewed persons (private person/zoological institutions/commercial breeders)	4 (3 privates, 1 Institution)

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Author: Christian Langner **28.08.2019**

Lygodactylus williamsi LOVERIDGE, 1952

Turquoise Dwarf Gecko, Williams' Dwarf Gecko

German: Türkisblauer Zwergtaggecko

Lygodactylus williamsi Photo credit: Christian Langner

Morphology

Snout-vent length: 84 mm.

Lygodactylus williamsi is a very colorful species. The ground color of adult males is bright blue. It has a black line from the eye to the nuchal region with two parallel thinner lines starting behind the eye, one above and one below it. The lower one is sometimes discontinuous. Over the forelimbs it has irregular black spots. The flanks are marked with smaller black dots. The venter is bright orange. The dorsum of females is turquoise to olive green and the venter mint green. Females also have black spots along the flanks and nuchal region. Like all species of the genus, they have well developed toe pads.

Geographic distribution, Habitat

The species is endemic for the Kimboza forest, a natural reserve of 385 ha northeast of Tanzania. It inhabits fragments of lowland rain forest in the east slopes of Uluguru Mountains. Here it primarily dwells on screwpine (*Pandanus*) which the preferred microhabitat of the species.

Type locality: Kimboza Forest, Morogoro Province, Tanzania, at 350 m asl.

Conservation status and main threats

CITES Annex I since 2016 (CoP17 Proposal 30).

EU Regulation 2017/160 [EG] Annex: A.

In Germany strictly and particularly protected under BNatSchG [BG] Status: b.

IUCN- Red List status: CR – Critically Endangered B1ab(iii,v)+2ab(iii,v) (assessed 22 February 2012).

The extremely small distribution range and habitat destruction are big threats to this critically endangered species. Additionally, the species was also threatened due to collection for the pet trade in the past.

Reproduction

Secondary sexual traits	Strong sexual dichromatism in adults
Sexual maturity	♀♀ 3-4 months, ♂♂ 3 months
Reproduction	Oviparous
Mating season	March in terrarium
Clutch size (Min. – Max.)	2
Clutch/ year	Up to 17
Incubation period	Ca. 90 days
Incubation temperature	30 days at 24 °C, afterwards at 28 °C
Hatching rate	Ca. 90 %
Maturity reaching rate	99 %
F2 Generation bred	Yes
Longevity in captivity	8 years
Sex ratio at hatching	Ca. 75 % females. By high incubation temperatures the hatchlings are male biased: if incubation temperature is around 27 °C, 95 % of the hatchlings will be males (after 61 - 68 days); if incubation temperature is 24 °C, 90 % of the hatchlings will be females
Trigger for reproduction	Not needed, they reproduce all year round
Size/weight of the hatchlings	26 - 29 mm TL
Amphigonia retardata, sperm storage	Yes, 1 - 2 clutches are laid after females are separated from males

Husbandry and captive breeding

Trigger for reproduction (e.g. technical equipment, care, social and climatic conditions)	Tropic terrarium 40 x 40 x 60 cm (L x W x H). No data on maximum space is available. A good lighting with UVB is needed
General characteristics, difficulties with keeping and breeding	The clutch should be removed from the terrarium or protected with a mesh because the adults eat their young. However, this is difficult to implement because the eggs are glued on the substrate
Care of the young, technical and time effort	The young can be kept in groups (known to be kept up to 10 individuals). Energy required ca. 0.48 KW/day. The spraying and feeding takes ca. 20 minutes per month
Breeding difficulty evaluation	Easy. Breeding also possible for beginners as long as the general requirements are considered. Professional breeding is successful for more than ten years in Germany
Frequency of breeding in captivity	The species is bred regularly in captivity. 5157 offsprings have been produced since 2010 from a single commercial breeder in Oberhausen (Germany)
Number of evaluated questionnaires/interviewed persons (private person/zoological institutions/commercial breeders)	7 (4 privates, 2 institutions and 1 commercial breeder)

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Author: Christian Langner **28.08.2019**

Paroedura masobe NUSSBAUM & RAXWORTHY, 1994

German: Madagaskar-Riesenaugengecko

Paroedura masobe Photo credit: Christian Langner

Morphology

Total length: 200 mm.

The species has a highly contrasting coloration. Age dependent, the ground color of adults is black to brown. Along the dorsum and dorsal surfaces of the limbs scattered white, sometimes small golden spots are present. From the neck to the tip of the tail, small tubercular scales are present. The venter is light gray. The original tail is laterally flattened, marked with black and white bands, and has spiny tubercular scales on its crest. Adhesive lamellae toe pads are well developed. A further characteristic attribute is the pitch-black eyes.

Geographic distribution, Habitat

Paroedura masobe is endemic to the low land rainforests of east Madagascar between 300 and 600 m asl. Currently the species is only known from Zahamena national park and Betampona nature reserve.

Type localiy: Zahamena-Nationalpark, Madagascar.

Conservation status and main threats

CITES Annex II since 2016 (CoP17 Proposal 31).

EU Regulation 2017/160 [EG] Annex: B.

In Germany strictly and particularly protected under BNatSchG [BG] Status: b.

IUCN- Red List status: EN - Endangered B1ab(iii) (assessed 28 January 2011).

The species is extremely endangered, due to the very small distribution area and the rapid habitat destruction. Additionally, the collection for the pet trade in the past has threatened the species.

Reproduction

Secondary sexual traits	♀♀ are generally larger than ♂♂. Subadult and adult ♂♂ can be identified by their swollen cloacal region (hemipenis base)
Sexual maturity	♀♀ should not mate before 2 years of age
Reproduction	Oviparous
Mating season	March (in terrarium)
Clutch size (Min. – Max.)	2 round eggs of 1 cm diameter
Clutch / year	Up to 4 possible
Female gravid period	4 - 5 weeks
Incubation period	Temperature depending between 4 and 6 months
Incubation temperature	24 - 25 °C, maximum 26 °C daytime; 19 - 22 °C at night
Maturity reaching rate	99 %
F2 Generation bred	Yes
Size/weight of the hatchlings	5 - 6 cm / ca. 3 g
Amphigonia retardata, sperm storage	Yes

Husbandry and captive breeding

Trigger for reproduction (e.g. technical equipment, care, social and climatic conditions)	Rain forest terrarium (50 x 50 x 70 cm) with moderate lighting with neon tubes. It is recommended to keep adults individually. Cool temperatures of 20 - 24 °C during day time, and lower at night with high humidity is needed. A calcium-carbonate based supplementation is essential, and a bowl of fresh water should be always available
General characteristics, difficulties with keeping and breeding	In addition to the supplemented insects, it seems that females require snails for reproduction

Care of the young, technical and time effort	The juveniles should be kept individually in plastic boxes during the first weeks. The terrarium should be equipped with soil, coconut humus, small branches, a small devil's ivy (*Epipremnum sp.*), *Sphagnum* moss, and a small flowerpot and cork pieces serve as shelter. Approximately one week after hatching, the juveniles feed readily on small house crickets and cockroaches. After the juveniles reached 3 months of age, they can be kept together in groups of 3 - 4 in small terrariums of 50 x 40 x 50 cm
Breeding difficulty evaluation	Very challenging. Breeding is possible for advanced gecko keepers
Frequency of breeding in captivity	The species is continuously bred, but only by very few keepers
Number of evaluated questionnaires/interviewed persons (private person/zoological institutions/commercial breeders)	4 (privates)

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Author: Christian Langner **28.08.2019**

Lanthanotidae

Lanthanotus borneensis (STEINDACHNER, 1878)

Borneo Earless Monitor

German: Borneo Taubwaran

Lanthanotus borneensis Photo credit: Christian Langner

Morphology

Total length: max. 55 cm.

The ground color of Borneo earless monitors is chocolate brown. The venter is slightly lighter-colored. Several rows of osteoderms run along the dorsum of body and tail. The limbs are small and robust and have five fingers. The head is flattened and the nostrils are located on top of the snout. Borneo earless monitors have very sharp teeth, which can cause bleeding wounds. The eyelids are transparent and allow to see under water. The tail is slightly longer than the body and prehensile. Contrary to allied monitors, the Borneo earless monitor does not have a gular fold. As the common name indicates, it lacks an external ear opening. The family Lanthanotidae is one of just three monotypic saurian families.

Geographic distribution, Habitat

The Borneo earless monitor is endemic to Borneo and occurs only in the northern part of the island. There is confirmation that the species occurs in the state of Sarawak in the Malaysian part of Borneo and in the Indonesian provinces of Kalimantan Barat and Kalimantan Timur.

Lanthanotus borneensis is semi-aquatic and nocturnal. The author was able to observe the species for the first time in its natural habitat near a stream in a relatively dense population in Kalimantan Barat.

Type locality: Sarawak, Malaysia.

Conservation status and main threats

CITES Annex II since 2016 (CoP17 Proposal 32).

EU Regulation 2017/160 [EG] Annex: B.

In Germany strictly and particularly protected under BNatSchG [BG] Status: b.

IUCN- Red List status: not assessed.

The main threat is habitat loss, due to massive deforestation of rainforests for the palm oil industry. Their habitat, which is home of unique flora and fauna, is being irreversibly destroyed at a tearing pace. The rain forests of Borneo, hot spots of biodiversity, are one of the most species rich forests worldwide.

Borneo earless monitors are found in areas with high anthropogenic impact in relatively high abundances.

Reproduction

Secondary sexual traits	♂♂ have bigger heads than ♀♀; the cloacal region of the ♂♂ is slightly swollen, due to the hemipenes base
Reproduction	Oviparous
Mating season	Late spring and summer under captive conditions
Incubation temperature	26 - 29 °C; it has been repeatedly reported that at incubation temperatures above 26 °C, hatchlings died immediately before hatching
Incubation time	65 - 92 days (temperature dependent)
Clutch size (Min. – Max.)	3 - 12
Clutch / year	1
Offspring size / weight	11.5- 14 cm / 2.58 – 4.2 g

Husbandry and captive breeding

Trigger for reproduction	Slightly seasonal cooling down of keeping temperature from 25 - 26 °C to 23 - 24 °C
Keeping difficulty	The species should be kept in an aqua-terrarium of minimum 80 x 60 x 60 cm (L x W x H), with one third of the surface being land. The water should be filtered and heated to 26 °C. The room temperature should be between 25 - 26 °C. The terrestrial part should exhibit robust plants and sufficient shelter. A plastic box filled with *Sphagnum* moss is used as an egg laying box. Earless monitors can be fed with fish, shrimps and earthworms. Occasionally, insects and mussels are taken as well
General characteristics, difficulties with keeping and breeding	The copula takes place in water. It is possible to keep one male with several females. However, due to the highly aggressive behavior of males, it is not possible to keep males together
Breeding difficulty evaluation	Breeding is successfully done by experienced keepers
Estimation of the frequency of breeding in captivity	In the recent years breeding occurs regularly in zoos and by private keepers
Number of evaluated questionnaires/interviewed persons (private person/zoological institutions/commercial breeders)	4 (3 privates, 1 Institution)

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Author: Christian Langner **28.08.2019**

Shinisauridae

Shinisaurus crocodilurus AHL, 1930

Crocodile lizard

German: Krokodilschwanzechse

Shinisaurus crocodilurus Photo credit: Christian Langner

Morphology

Total length: 55 cm max.

The body shape of these semiaquatic lizards resembles crocodiles. Crocodile lizards have a robust tail, which they use to control direction while swimming. Ground color is very variable, mostly based on brown and beige colors and some bright red and orange tones that could be present on the flanks and gular region and sometimes on the venter. Some individuals can exhibit also yellowish colors. Often, the species has thin dark lines radiating from the eye in a star like shape around, which can extend to the lower jaw. A characteristic morphological trait of Crocodile lizards is the presence of enlarged osteoderms on the dorsal body surface.

Populations of Chinese crocodile lizards were discovered in Vietnam in 2003. The Vietnamese population of *Shinisaurus crocodilurus vietnamensis* was described as a distinct subspecies in 2016.

Geographic distribution, Habitat

Crocodile lizards occur in the provinces Guangxi and Guangdong in South China and in the provinces Bac Giang and Quang Ninh in Northeast Vietnam. They prefer densely overgrown small running streams in evergreen broad-leaf forests. The prefer to rest on branches upon natural back water pools of small forest streams behind waterfalls.

Type locality: *Shinisaurus crocodilurus crocodilurus*: Kwangsi [Guangxi], China. *Shinisaurus crocodilurus vietnamensis*: Sơn Động District, Bắc Giang Province, Northeast of Vietnam at 407 m asl.

Conservation status and main threats

CITES Appendix I since 2016 (CoP17 Proposal 33).

EU Regulation 2017/160 [EG] Annex: A.

In Germany strictly and particularly protected under BNatSchG [BG] Status: b.

IUCN- Red List status: EN – Endangered B1ab(ii,iii,iv,v) (assessed 20 March 2014).

Crocodile lizards belong to the world's most threatened reptile species. It is estimated that there are about a thousand wild individuals left in China and only a few hundred individuals in Vietnam. The drastic population decline during the last years has been mainly caused by habitat destruction and collection for the use in the traditional Chinese medicine as well as for the international pet trade. Meanwhile, a stable captive population of *S. c. crocodilurus* has been established, which allows to cover the current demand of captive bred specimens.

Reproduction

Secondary sexual traits	Sexing of individuals based on coloration is challenging since females can be also very colorful. Endoscopy is the only accurate method to identify the sex of an individual. Sometimes the intraspecific behavior can help to identify sexes, as males will react agressive towards other males but will start tongue flicking or trying to mate if a female is present. However, this is not an accurate method because females also show aggressive behavior towards other females
Reproduction	Viviparous (lecithotrophe)
Mating season	Late spring and summer in captivity
Birth season	March / April, exceptionally in autumn
Litter size (Min. – Max.)	1 - 16, on average 7
Litter / year	1
Offspring size / weight	8.3 - 13 cm / 3 - 5 g, exceptionally 13 g
Sexual maturity	With 3 years
Longevity in captivity	Animals with a current age of 26 years are known
Mortality	< 2 %

F2 Generation bred	Yes
Gestation period	8 - 14 months

Husbandry and captive breeding

Trigger for reproduction (e.g. technical equipment, care, social and climatic conditions)	For successful breeding a hibernation period from November until March with temperatures between 5 and 12 °C is needed. It is not always easy to find an appropriate mate
Keeping difficulty	From the minimum requirements for the keeping of reptiles given by the Federal Ministry for Food and Agriculture, the minimum dimensions would be 90 x 60 x 60 cm, but the 60 cm height are considered too low. It is considered that 80 -100 cm height is the minimum for this species, which usually perch above the water level. A surface of 120 x 60 cm is recommended. The aquaterrarium should have one third of land surface. The water should be filtered. A local UV spot with 30 - 32 °C should be offered. Air temperature should be between 20 and 24 °C during daytime. The land surface should have robust plants. Outdoors keeping in summer is possible as well as keeping in a frost-protected place the entire year round
General characteristics, difficulties with keeping and breeding	They can be kept in pairs or in groups with only one male. Due to the aggressive behavior of males, males should not be kept together. Juveniles have been found in the parents terrarium after three months indicating that adults do not chase and feed on their youngs. However, for a better control the juveniles should be kept separated from their progenitors. Some keepers recommend to keep juveniles individually because they are very susceptible to stress
Care of the young, technical and time effort	Water has to be changed every 2 - 3 days. A variety of food items should be continuously offered, such as small crickets, waxworms or small worms, supplemented with vitamins and minerals. 0,48 KW/day for technical equipment and ca. 1 hour time per terrarium/month for feeding etc.
Breeding difficulty evaluation	Successful and frequent breeding by experienced keepers
Frequency of breeding in captivity	Breeding frequently occurred in the last years both in zoos and by private keepers

Number of evaluated questionnaires/interviewed persons (institution/private/scientists/commercial breeder)	8 (5 private, 2 institutions, 1 commercial breeder)

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A more comprehensive list of references can be found in the appendix.

Author: Christian Langner **06.09.2019**

Snakes – Viperidae

Atheris desaixi ASHE, 1968

Ashe's Bush Viper, Mount Kenya Bush Viper

German: Mount Kenia Buschviper

Atheris desaixi Photo credit: Ralph Braun

Morphology

Total length: max. 80 cm.

The adult ground color is black with an irregular yellow pattern. The black scales continuously exhibit a yellow tip posterior. This fine yellow mottled appearance is especially conspicuous in the head region. The venter is dirty yellow. The juvenile coloration differs from that of adults. Usually they are brown with some yellow coloration already present, but sometimes plane brown. All juveniles bear a white tail tip.

Geographic distribution, Habitat

Atheris desaixi occurs in the last remaining pockets of rain forests in Kenya. To date only two isolated populations are known in the southeast slope of Mount Kenya and further north in the Nyambeni Range. The species is mainly arboreal and is found in bushes and small trees at 1600 m asl.

Type locality: Nahe Chuka, Mount Kenya.

Conservation status and main threats

CITES Annex II since 2016 (CoP17 Proposal 34).

EU Regulation 2017/160 [EG] Annex: B.

In Germany strictly and particularly protected under BNatSchG [BG] Status: b.

IUCN- Red List status: EN – Endangered B1ab(iii,v) (assessed 28 January 2014).

The main threat of this species is habitat loss, due to deforestation mainly for tea plantations.

Reproduction

Secondary sexual traits	The sex can be determined via cloacal probing
Reproduction	Viviparous
Mating season	April to June
Birth season	March
Clutch size (Min. – Max.):	6 - 13
Clutch / year	1
Gestation period	10.5 months
Offspring size	Ca. 17 - 21 cm

Husbandry and captive breeding

Trigger for reproduction (e.g. technical equipment, care, social and climatic conditions)	In order to imitate natural conditions, a rainy season of several weeks has to be simulated by misting with water two times daily. Day maximum temperature should be 25 °C. These climatic conditions lead to a higher mating activity, which takes places mainly in the early morning. Animals are kept in 2:1 ratio. Males usually stop feeding during the mating season
Keeping difficulty	The species is usually kept in terrariums of 90 x 60 x 60 cm, with a ground layer of forest soil. Branches for climbing and wood with holes for shelter should be provided
General characteristics, difficulties with keeping and breeding	The copula occurs on the ground. No aggressive behavior between males has been observed
Security measures required	General security regulations, and eventually keeping limitations for venomous snakes, regulated by state law, should be considered. There is no specific antiserum available. It is recommended to keep polyvalent antiserum (central-south Africa). Alternatively choose membership of a serum depot. However, the efficacy of polyvalent antiserum for this species is unknown. Bite cases are very rare. A bite of this species should be considered dangerous but it is not

	life threatening. To date the only available information on post bite symptoms are by the catcher of the holotype, who was bitten with one fang on the pointer finger. In this case, a compression bandage was applied and the patient was given an undescribed antiserum. The symptoms were swelling and pain but he was fully recovered. The effectiveness of an unspecific antiserum is doubtful, and the application of a tourniquet is not recommended. The part of the body which has been bitten should be kept immobile and calm, and the patient should be taken to a hospital laying if possible. Patients should be monitored for at least 12 hours
Breeding difficulty evaluation	For experienced keepers of venomous snakes
Estimation of the frequency of breeding in captivity	Very rare
Number of evaluated questionnaires/interviewed persons (private person/zoological institutions/commercial breeders)	2 (privates)

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Author: Christian Langner **28.08.2019**

Bitis worthingtoni PARKER, 1932

Kenya Horned Viper

German: Worthingtons Viper, Kenia-Hornpuffotter

Bitis worthingtoni Photo credit: Ralph Braun

Morphology

Total length: max. 50 mm.

A notable characteristic of this small viper are the supra-ocular spinelike scales. The ground color varies from light grey to powder blue or even different shades of brown. Two light, thin, white to beige bands are running along the dorsum. Within those two thin lines, half-moon shaped dark flecking occurs. Along the flanks an ingot formed pattern occurs, often shifted arranged to the halfmoon shaped fleckings.

The dorsal color is grey, interspersed with numerous dark mottlings.

Geographic distribution, Habitat

Bitis worthingtoni is endemic to the highlands of the central Rift Valley in Kenya, above 1500 m asl.

Type locality: Coast of Lake Naivasha in Kenya.

Conservation status and main threats

CITES Annex II since 2016 (CoP17 Proposal 35).

EU Regulation 2017/160 [EG] Annex: B.

In Germany strictly and particularly protected under BNatSchG [BG] Status: b.

IUCN- Red List status: VU – Vulnerable B1ab(iii) (assessed 28 January 2014).

The species is considered threatened, due to its patchy distribution and the numerous habitat destructions. Parts of its habitat are protected by Hell's Gate National Park. The introduction of carps (*Cyprinus carpio*) in Lake Naivasha few years ago, caused an ecological catastrophe in the area. Direct negative impacts on the snake population and other land-dwelling vertebrates have not been observed so far.

Reproduction

Secondary sexual traits	The tail of ♂♂ is longer than of ♀♀; cloacal probing is a more accurate method
Sexual maturity	At an age of 3 - 4 years
Reproduction	Viviparous
Mating season	October / November
Birth season	March
Litter size (Min. – Max.)	3 - 16
Clutch / year	1
Lifespan in captivity	A female is being kept since 2008
proportion of individuals reaching maturity	> 50 % (estimated)
F2 Generation bred	Yes
Offspring size / weight	Ca. 12 - 14 cm
Sex ratio at hatching	No detailed information is available. Usually slightly more males than females

Husbandry and captive breeding

Trigger for reproduction	Mating starts in autumn when the temperatures begin to drop
Keeping difficulty	Since *Bitis worthingtoni* occurs in the central Rift Valley, at ca. 1800 m asl, temperatures drop considerable at night. Morning dew is important for water balance since these snakes do not drink from water bowles but from water droplets, formed by dew and spraying. Therefore, they should be sprayed regularly

General characteristics, difficulties with keeping and breeding	*Bitis worthingtoni* should be kept individually and only put together for mating in autumn. Cases of successful reproduction when kept always as pair or in a group of three have been recorded. A second male increases the reproduction success by fighting rituals (comment fighting)
Security measures required	General security regulations, and eventually keeping limitations for venomous snakes, regulated by state law, should be considered. There is no specific antiserum available. It is recommended to keep polyvalent antiserum (central-south Africa) which should cover the genus *Bitis*. Alternatively, choose membership of a serum depot. However, the efficacy of polyvalent antiserum is unknown. Bite cases are very seldom. A bite of this species should be considered dangerous, but it is not life threatening. A bite leads to local swelling, bleeding and pain. General symptoms are headache, nausea, vomiting, abdominal pain, diarrhea, dizziness, cardiovascular problems, up to collapse. No evidence of blood coagulation exists. The "pressure-immobilization" method should not be used as this method could have harmful consequences. The part of the body which has been bitten should be kept immobile and calm, and the patient should be taken to a hospital laying if possible. Patients should be monitored for at least 12 hours
Breeding difficulty evaluation	For experienced keepers of venomous snakes
Estimation of the frequency of breeding in captivity	Rarely
Number of evaluated questionnaires/interviewed persons (private person/zoological institutions/commercial breeders)	2 (privates)

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Author: Christian Langner **28.08.2019**

Turtles – Trionychidae

Cyclanorbis elegans (GRAY, 1869)

Nubian Flapshell Turtle

German: Gefleckte Klappen-Weichschildkröte, Nubische Klappen-Weichschildkröte

Cyclanorbis elegans female in South Sudan Photo credit: Luca Luiselli

Morphology

Very large softshell turtle, maximum carapace length more than 70 cm.

The carapace of hatchlings is dark olive brown with large irregular blotches of yellow, the periphery sometimes with a few, scattered, somewhat smaller, roundish, yellow spots. The carapace of adults is light brown to olive green with light green spots near the edges.

Geographic distribution, Habitat

Former range: Cameroon; Central African Republic; Chad; Ghana; Nigeria; South Sudan; Sudan; Togo. The IUCN assessment document (BAKER *et al.* 2016) contains a detailed distribution map. It appears that *Cyclanorbis elegans* has disappeared from several, if not most, of the major river systems that the species is historically known to have inhabited. Living individuals were rediscovered in 2018 in White Nile River course between the towns of Juba and Mongalla in South Sudan.

The two *Cyclanorbis* species, *C. elegans* and *C. senegalensis*, co-occur throughout much of their distribution, and for non-specialists the two species are not easy to tell apart.

While no reliable habitat information is available for *Cyclanorbis elegans*, it is generally understood that this is a species that inhabits large rivers with muddy substrates. The habitats of the rediscovered turtles were very large stretches of the riverbed, with the presence of ponds and swamps in the surroundings and abundant bank vegetation.

Conservation status and main threats

CITES Appendix II since 2016 (CoP17 Proposal 36).

EU regulation 2017/160 [EG]: Annex: B.

In Germany strictly and particularly protected by BNatSchG [BG] Status: b.

IUCN-Red List: CE (Critically Endangered A2bcd+4bcd, assessment 20 May 2016).

These turtles are hunted and eaten by local communities for subsistence and traditional medicine and are under serious threat due to overfishing and habitat loss. This species is not relevant for the international pet trade.

DEMAYA *et al.* (2019) consider that the creation of a new or expanded protected area for *Cyclanorbis elegans* should be an urgent conservation priority and the establishment of a captive assurance colony should also be realized.

Reproduction

Secondary sexual characteristics	For ♂♂, the tail is visible beyond the rim of the carapace in ventral view and is wide and blunt, while that of the ♀♀ is tapered and concealed beneath the caudal flap
Sexual maturity	Unknown
Nesting sites	Sandy banks of rivers. The nests can be located by the local people by observing the activity of monitor lizards (*Varanus niloticus*), which are very efficient turtle egg predators at the study area
Reproductive season	Likely towards the end of the dry season (December to March)
Clutch size	One of the rediscovered females contained 27 oviductal eggs
Egg size / hatchling size	In this female the largest vitellogenic follicle was 5.1 cm in length
Incubation duration	Hatching and emergence from the nest may coincide with the beginning of the rainy season (April to November)
Sex determination	Unknown
Sperm storage	Unknown

Husbandry and captive breeding X

The last known captive individual died in 2012 in a private collection in the United States, and the species has not been recorded in zoos. Keeping is not difficult, according to the report of this private owner. These turtles, like all softshell turtles, need large tanks or ponds with soft substrate bottom to dig in. Recommended feeding is with fish, whole small mammals and even trout pellets.

The CITES trade database records a total of 27 imports of live *C. elegans* from Benin into the US in 2017, whereof 20 specimens were labeled with source code "R", and seven were confiscated/seized. These specimens might have been misidentified.

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A more comprehensive list of references can be found in the appendix.

Authors: Beate Pfau & Ronny Bakowskie **07.07.2019**

Our thanks for the review go to Luca Luiselli

Cyclanorbis senegalensis (DUMÉRIL & BIBRON, 1835)

Senegal Flapshell Turtle, Sahelian Flapshell Turtle

German: Senegal Klappen-Weichschildkröte

Cyclanorbis senegalensis Photo credit: Felix Hulbert

Morphology

Rather small flapshell turtle, rarely exceeding 35 cm CL, at which size it weighs just under 5 kg.

The head is olive green, grey or brownish with several whitish or yellowish spots, the carapace is brownish or olive green with large patches of dark olive color which forms a pattern of darker and lighter olive green.

Geographic distribution, Habitat

Cyclanorbis senegalensis ranges through most of the sub-Saharan Sahel-Savannah zone, including southern Senegal, Gambia, Guinea-Bissau, Mali, Burkina Faso, Liberia, Ivory Coast (Côte d'Ivoire), Ghana, Togo, Benin, Niger, Nigeria, Cameroon, Chad, Central African Republic, South Sudan, Sudan, and Ethiopia. It may also occur peripherally in adjacent Guinea, and conceivably in northern Uganda. It has also recently been recorded in Sierra Leone.

There appear to be three large, disjunct populations: one in West Africa from Senegal to western Nigeria; one in central Africa from Lake Tchad to northern Central African Republic; and one in eastern Africa in Sudan and South Sudan extending into western Ethiopia. Genetic analyses (comparison of sequences of three mitochondrial DNA blocks) revealed slight

differences between the population in Ethiopia and the other two, which are rather similar, however this method seems not suitable for discerning the geographic origin of a specimen with adequate accuracy. The IUCN assessment document (DIAGNE *et al.* 2016) contains a detailed distribution map of this species.

Adults inhabit predominantly large permanent ponds as well as deeper, relatively calm parts in riverine forests within the savanna zone, whereas hatchlings and juveniles may be found far from these habitats in temporary savannah waters. In contrast to other African softshell turtles *Cyclanorbis senegalensis* can to travel large distances over land and may be found in remote, small water bodies with high productivity.

Conservation status and main threats

CITES Appendix II since 2016 (CoP17 Proposal 36).

EU regulation 2017/160 [EG]: Annex: B.

In Germany strictly and particularly protected by BNatSchG [BG] Status: b.

IUCN-Red List: VU Vulnerable A2bcd+4bcd, (assessment 20 May 2016).

This is a widespread African species perceived to be declining across much of its range, especially in West Africa. Declines are due to a combination of exploitation for local consumption and fetish purposes plus some international pet trade; with habitat impacts including, in particular, aridification due to climate change and intensive use of water resources for agriculture.

Reproduction

Secondary sexual characteristics	The largest animals that had been found were females
Sexual maturity	Unknown
Nesting sites	Sandbars appearing in the dry season
Reproductive season	Mid to late dry season, in Sudan in mid of April, in Togo January to beginning of February
Clutch size	6 - 25 eggs per clutch, more detailed data are lacking
Egg size / hatchling size	The eggs are round and hard-shelled, with a diameter of ca. 36 mm, the smallest hatchling found in nature had a CL of 40.6 mm
Incubation duration	Unknown, the hatchlings appear at the onset of the rainy season
Sex determination	Unknown
Sperm storage	Unknown

Husbandry and captive breeding

Captive husbandry is not difficult, but the conditions needed to induce captive reproduction are still unknown. Like all Softshell turtles *Cyclanorbis senegalensis* need rather large tanks with good water quality and soft bottom substrates to bury themselves. They accept all kinds of animal food, even fish food pellets. Even though the animals seem to be not aggressive cases of intraspecific cannibalism has been observed.

Cyclanorbis senegalensis is imported in small numbers, and occasionally a few captive bred juveniles have been offered on trade platforms, but up to now the breeders did not react to our requests for more information.

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A more comprehensive list of references can be found in the appendix.

Authors: Beate Pfau & Ronny Bakowskie **07.07.2019**

Cycloderma aubryi (DUMÉRIL, 1856)

Aubry‘s Flapshell Turtle

German: Rotrückige Klappen-Weichschildkröte

Cycloderma aubryi Photo credit: Tomas Diagne

Morphology

Medium to large softshell turtle, females to 55 cm CL, males to 40 cm CL, weight to 18.5 kg.

Juveniles have conspicuously orange colored heads and necks with a narrow dark stripe running from the nostrils through the irises and along the neck, and a reddish carapace with black dots. Adults are usually brownish, male’s heads turning red in the mating season. The upper lips of this species are conspicuously enlarged, and helpful for the suction feeding behavior of this species.

Geographic distribution, Habitat

Cycloderma aubryi inhabits the Congo River basin of the Democratic Republic of the Congo (DRC), Congo (ROC), and southwestern Central African Republic, as well as the lower Ogooué River basin and coastal regions of Gabon. It possibly occurs in southeastern Cameroon, and may conceivably occur in extreme northern Angola and Cabinda.

Adults live in side branches and tributaries of slow-flowing rivers, and in large reed areas. Juveniles utilize flooded forest habitats. These turtles feed mainly on fish, crabs and crayfish. Juveniles probably take also insects as food.

Conservation status and main threats

CITES Appendix II since 2016 (CoP17 Proposal 36).

EU regulation 2017/160 [EG]: Annex: B.

In Germany strictly and particularly protected by BNatSchG [BG] Status: b.

IUCN-Red List VU (Vulnerable A2bd+4bd, assessment 13 June 2016).

The sustained collection of eggs and adults of *Cycloderma aubryi* for local consumption is understood to be the leading cause of decline of the species. There are no reports on trade of animals, meat or eggs across national boundaries.

Inclusion or upgrading its status, in national legislation is probably warranted, possibly supported by monitoring of international trade for the pet market.

Reproduction

Secondary sexual characteristics	Only visible on adults: Tip of the tail of males slightly protruding beyond the carapace rim, females have a convex plastron. Adult males are smaller, usually 40 cm (max. 46.6 cm at 9,5 kg) carapace length, than adult females with about 43 - 50 cm (max. 61 cm at 18.5 kg)
Sexual maturity	In both sexes with > 30 - 35 cm carapace length, and at 3 - 4.5 kg
Nesting sites	Nesting probably takes place in the woods in sandy substrate
Reproductive season	Minor dry season, January to March
Clutch size	17 - 34 eggs per clutch, at least 2 clutches per year
Egg size / hatchling size	Eggs are round and hard shelled, 30 - 35 mm in diameter, between 17 - 22 g. Hatchlings have ca. 55 mm carapace length and ca. 44 mm carapace width
Incubation duration	The eggs hatch in the rainy season between March and May
Sex determination	Unknown
Sperm storage	Unknown

Husbandry and captive breeding X

Adult wild caught turtles acclimate easily to captivity, but they are prone to skin infections. They usually accept live or dead fish and fish meat cut in pieces, but crabs and crayfish should also be offered. These turtles are tolerant to each other, and they never show any aggression like scratching or biting when handled. Mating could be observed in a large aquarium in a zoo, and at a private breeder's even (infertile) eggs could be found, but there is no record of captive breeding.

Specimens showing signs of having been wild caught recently, laundered as being captive bred, have already been confiscated at JFK airport (B. HORNE pers. comm. in CHIRIO *et al.* 2017).

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A more comprehensive list of references can be found in the appendix.

Authors: Beate Pfau & Ronny Bakowskie **05.07.2019**

Our thanks for the review go to Luca Luiselli

Update July 2021: In the meantime, photos of captive hatchlings of *Cycloderma aubryi* could be seen in the social media. The breeding success has not yet been published.

Cycloderma frenatum PETERS, 1854

Zambezi Flapshell Turtle

German: Graue Klappen-Weichschildkröte, Sambesi-Klappenweichschildkröte

Cycloderma frenatum Photo credit: Tomas Diagne

Morphology

Fairly large flapshell turtle, in both sexes usually up to 56 cm CL and weighing ca. 14 kg.

Coloration olive-gray, head and neck with dark, longitudinal lines. The carapace of the young turtles has a moderate vertebral keel and numerous, wavy, longitudinal ridges, the carapace of adults is smooth.

Geographic distribution, Habitat

Rivers and lakes in eastern Africa, from the Rufiji River basin in Tanzania in the north through Lake Malawi and the Rufiji, Rovuma, and Lower Zambezi river basins, extending south to the lower Save (Sabi) river of southeastern Zimbabwe and central Mozambique. Recorded also from Zambia. The IUCN assessment document (VAN DIJK *et al.* 2016) contains a detailed distribution map.

Adults turtles live mainly in large rivers and lakes with sandy bottoms. The juveniles emerge from the nests within only three weeks in January, at the beginning of the rainy season, and they first inhabit temporarily flooded areas. The juveniles prey on fish using suction feeding, while the larger turtles also may eat fish, which they actively stalk, but their main foods are mussels, clams and snails, which they dig up with the powerful claws on the forefeet from the substrate of rivers and lakes, and then crush them open.

Conservation status and main threats

CITES Appendix II since 2016 (CoP17 Proposal 36).

EU regulation 2017/160 [EG]: Annex: B.

In Germany strictly and particularly protected by BNatSchG [BG] Status: b.

IUCN-Red List EN (Endangered A3d, assessed 3. June 2016).

Eggs and nesting females are known to be collected / captured and used for local consumption. Reports have emerged in recent years, that large numbers of adults are caught, slaughtered, and processed locally for export of shells and dried meat to China and East Asia. Water pollution has additionally been suggested as a potential impact on the species, and the crocodiles in this region may have shifted their prey in part to large flapshell turtles, because their normal prey animals have been reduced due to human exploitation.

The species has been reported in the international pet trade, but not in any great numbers. Monitoring of key populations and surveillance of trade developments of live animals, as well as meat and dried shells, are needed as priority actions.

Reproduction

Secondary sexual characteristics	Only visible in adult turtles, the tail tip of the male is a bit longer than the rim of the carapace and is carried bent upwards
Sexual maturity	Unknown
Nesting sites	Nesting occurs at night, in the shadow area under trees or bushes, usually less than 200 m from the water, in rather shallow pits
Reproductive season	December to March, locally extended until end of April
Clutch size	15 - 25 eggs per clutch, several clutches per year
Egg size / hatchling size	Eggs are round and hard shelled, 32 - 35 mm in diameter. Hatchlings have 40 - 48 mm carapace length and 30 - 35 mm carapace width and weigh ca. 15 g
Incubation duration	205 - 209 days, the hatchlings emerge from the nests simultaneously after 8 - 11 months, in the first days of the rainy season

Husbandry and captive breeding X

A few Zambezi flapshelled turtles have been reported from captivity. Freshly caught imports are said to be reluctant to feed in captivity and very susceptible to microbial infections. When they grow large one must carefully observe pugnacious incompatibilities. Captive breeding hat not been reported.

It has been suggested that the Wild Life authorities of Zimbabwe and Mozambique could task the local crocodile farms to collect and incubate the eggs of these turtles, and later release head-started juveniles into suitable natural habitats (BROADLEY & SACHSSE 2011). It is not known whether this plan has been realized.

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A more comprehensive list of references can be found in the appendix.

Authors: Ronny Bakowskie & Beate Pfau **14.07.2019**

Update July 2021: In the meantime photos of captive hatchlings of *Cycloderma frenatum* could be seen in the social media. The breeding success has not yet been published.

Rafetus euphraticus (DAUDIN, 1801)

Euphrates Softshell Turtle, Mesopotamian Softshell Turtle

German Names: Euphrat-Weichschildkröte, Mesopotamische Weichschildkröte

Rafetus euphraticus (in the wild) Photo credit: Barbod Safaei-Mahroo

Morphology

Large softshell turtle, maximum carapace length 68 cm at a weight of more than 20 kg.

Mainly olive-green turtles with cream-colored spots on the head. The snout is proportionally shorter and thicker than that of *Trionyx triunguis* or *Pelodiscus sinensis*, which look superficially similar.

Geographic distribution, Habitat

The Mesopotamian Softshell turtle lives in the river basin of the Euphrates and Tigris rivers, in southeastern Turkey, Syria, Iraq and southwestern Iran. The IUCN assessment document (GHAFFARI *et al.* 2017) contains a detailed distribution map.

Rafetus euphraticus is almost exclusively riverine, inhabiting various freshwater habitats, preferably permanent and temporary tributaries and oxbow lakes, as well as slow-flowing sections of the main river channel.

The species is particularly thermophilic.

Conservation status and main threats

CITES Appendix II since 2016 (CoP17 Proposal 36).

EU regulation 2017/160 [EG]: Amendment: B.

In Germany strictly and particularly protected by BNatSchG [BG] Status: b.

IUCN-Red List EN (Endangered A4c, assessment 28 May 2016).

Anthropogenic fragmentation, alteration, and destruction of suitable habitat throughout its range are the main threats to *Rafetus euphraticus*.

No trade or widespread consumption of this species has been reported. A few animals are consumed by various ethnic groups, or by the workers of the Chinese dam construction projects in this region.

Throughout its distribution in Iran, the killing or capture of *Rafetus euphraticus* is legally prohibited. In Turkey, the species is under protection of national law.

Reproduction

Secondary sexual characteristics	Not discernible on external view, males and females attain the same size. Females tend to have a broader carapace than males, and a slightly shorter tail
Sexual maturity	At about 20 cm CL
Nesting sites	Sandy riverbanks close to the waterline (< 5m from the waterline)
Reproductive season	Mating in Iran in March, nesting from late April to early June. Possibly several clutches per year
Clutch size	From 4 - 5 eggs per nest (Iran) up to more than 30 (Iraq, Turkey). It is unknown whether the eggs of one clutch can be distributed into several nests
Egg size / hatchling size	Eggs spherical and 29.5 mm in diameter, average weight 13.6 g. Mean size of hatchlings 41.5 mm and mean weight 10.8 g.
Incubation duration	Unknown, hatchlings emerge from their nest in early July
Sex determination	Probably genetic
Sperm storage	Unknown

Husbandry and captive breeding

This species is rarely kept in captivity. The turtles are quite susceptible for skin infections and need large tanks or ponds with soft bottom substrate to dig in. The water quality requirements are high, but feeding is rather easy, usually with freshly killed fish.

Rafetus euphraticus has been successfully kept and bred at the Ege University, Izmir, Turkey, but detailed information is missing. Large scale breeding or even farming for the pet trade is unlikely due to the intraspecific aggression of this species.

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A more comprehensive list of references can be found in the appendix.

Authors: Beate Pfau & Ronny Bakowskie **11.07.2019**

Our thanks for the review go to Hanyeh Ghaffari and Ertan Taşkavak

Trionyx triunguis (FORSKÅL, 1775)

Nile Softshell Turtle, African Softshell Turtle

German Names: Nil-Weichschildkröte, Afrikanische Weichschildkröte

Trionyx triunguis im Alexander River, Israel Photo credit: Job Stumpel

Morphology

Very large softshell turtle, maximum carapace length more than 80 cm.

Mainly olive to brown turtles, younger specimens often show a spattering of white spots, which may be ringed in yellow. Three conspicuous claws on each limb.

Geographic distribution, Habitat

The African Softshell turtle ranges widely the eastern Mediterranean (Turkey, Israel, Syria, Lebanon, Egypt) and in Africa (from Sudan westwards to Senegal and south-eastwards to Somalia, in southwestern Africa into northern Namibia). Vagrant to Greece.

References to occurrences in other European countries are mainly misidentifications of the species. The IUCN assessment document (VAN DIJK *et al.* 2017) contains a detailed distribution map.

Trionyx triunguis inhabits fairly deep water in permanent lakes, rivers, estuaries, coastal lagoons and coastal waters, down to 80 m depth. It is highly tolerant of full seawater conditions for some time.

Several local forms can be differentiated by genetic methods.

Conservation status and main threats

CITES Appendix II since 2016 (CoP17 Proposal 36).

EU regulation 2017/160 [EG]: Annex: B.

In Germany strictly and particularly protected by BNatSchG [BG] Status: b.

IUCN-Red List VU (Vulnerable A4bcd, assessment 21 June 2016). The West African populations likely warrant regional listing as Critically Endangered.

Trionyx triunguis is widely collected for consumption in the Sub-Saharan part of its distribution, mainly at local subsistence level. It is also hunted by fishermen for the bushmeat trade in West Africa, but the trade level remains low because this species is very rarely encountered in the field. Nonetheless, the meat is highly valued, and the prices are considerable. Hatchlings are occasionally sold as pets.

Reproduction

Secondary sexual characteristics	Uncertain in living animals. Tip of the tail of males may be slightly protruding beyond the carapace rim
Sexual maturity	Unknown
Nesting sites	Exposed sandbanks and grassy banks with heavier soil along rivers, also marine beaches
Reproductive season	About two months, in Africa (Gabon) in the minor dry season, December to February, in the eastern Mediterranean in early summer, May to August, depending on the local climate
Clutch size	In Turkey usually 25 - 40 eggs per clutch, maximum clutch size is 52. Clutch size of African populations is unknown. Several clutches per female and year seem possible
Egg size / hatchling size	Eggs are round and hard shelled, ca. 32 mm in diameter and between 20 - 23 g. Hatchlings carapaces are 42 - 54 mm long and weigh 8 - 17 g
Incubation duration	65 - 75 days in natural nests, at constant 27 °C it takes 82 days until hatching, at constant 33 °C the incubation duration is 55 days
Sex determination	Genetic
Sperm storage	Unknown

Husbandry and captive breeding

Sometimes shown in zoos, or kept as pets, must be housed individually, except in very large ponds with hiding places in appropriate climate. Under these conditions, hatchlings may be found occasionally. Prof. MENDELSSOHN had maintained such a reproductive group at the University of Tel Aviv.

Regular captive breeding or even commercial farming for pet turtle production is unlikely because of the aggressive behavior of this species towards conspecifics.

Most publications on captive breeding are on misidentified other softshell turtle species.

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A more comprehensive list of references can be found in the appendix.

Beate Pfau & Ronny Bakowskie **07.07.2019**

Our thanks for the review go to Luca Luiselli

Testudo horsfieldii GRAY, 1844

Steppe Tortoise, Central Asian Tortoise, Afghan Tortoise, Four-toed Tortoise, Horsfield's Tortoise

German Names: Steppenschildkröte, Vierzehen-Landschildkröte, Russische Landschildkröte

Testudo horsfieldii, female, captive bred in Germany Photo credit: Beate Pfau

Morphology

Females may attain a CL of 30 cm, but the usual size of adult females is 20 - 25 cm CL, males are smaller than females.

There are several recognized subspecies: *Testudo h. horsfieldii, T.h. bogdanovi, T.h. kazachstanica, T.h. kuznetzovi* and *T.h. rustamovi* (RHODIN *et al.* 2017). Other authors published different subspecies names. It is not known whether there are major differences in natural history between the subspecies. *Testudo horsfieldii kazachstanica* is the subspecies, which is most frequently imported into Central Europe.

The round to oval shaped carapace is yellowish-brown and in younger tortoises, there are darker markings in the central area of each shield. These tortoises have four claws on the toes of the forelegs and the scales on the forearms are strongly developed.

Geographic distribution, Habitat

Testudo horsfieldii naturally occurs in Afghanistan, China (Xinjiang), Iran, Kazakhstan, Kirghizia, Pakistan, Tajikistan, Turkmenistan and Uzbekistan. The rather large distribution area stretches from East to West approximately 2.500 km and from North to South ca. 1.500 km. Abandoned pet turtles may build up smaller populations in other areas, as reported for Lithuania, for example.

This tortoise species lives in sparsely covered steppes. The activity period is restricted to about three months (100 days) per year, because of the harsh, arid climate with very hot summer months and very cold winters. Tortoises dig dens up to 2 m undergrounds, where they reside during the inactive period. Steppe tortoises are almost exclusively herbivores, but they like to chew on old bones and snail shells for calcium uptake.

Conservation status and main threats

CITES Appendix II since 1976 (CoP1 Proposal 443).

EU regulation 2017/160 [EG]: Annex: B.

In Germany strictly and particularly protected by BNatSchG [BG] Status: b.

IUCN-Red List VU (Vulnerable (Vulnerable A2d - assessed 1 August 1996).

This species is protected by local regulations in Kazakhstan since 2003, and in Tajikistan since 2009. Collecting licences are available, and this is justified with data on high population density, but there is no possibility for plausibility checks for these data. There are also quite some reports on illegal collecting in large extent.

In other countries within the natural range (i.e. Uzbekistan) the species is not specifically protected.

Steppe tortoises are also exported from countries outside their natural range, particularly from Ukraine. According to the CITES trade database wild caught specimens without indication of source have been exported, and after the Animals Committee meeting in 2011 only captive bred or captive born tortoises (Source Code „C“ or „F“) have been registered in this database.

Reproduction

Secondary sexual characteristics	The tails of ♂♂ are conspicuously longer and thicker than the tails of ♀♀
Sexual maturity	Uzbekistan: ♀♀ with more than 11 cm plastron length, but mostly with about 15 cm plastron length. ♂♂ with more than 9 cm plastron length, mostly with 12 cm pastron length; both sexes at ca. 10 years of age Kazakhstan: ♀♀ with 13 - 14 cm and 13 - 14 years, ♂♂ with 11 - 12 cm and 11 - 12 years
Nesting sites	The eggs are buried in the soil. No more details are known
Reproductive season	First week of May thru third week of June in Uzbekistan. The females do not use the lipid storage of the previous year for yolk production like many other tortoises do, but they provide

	the yolk substances from the nutritients they have just taken up after hibernation
Clutch size	Usbekistan: 1 - 5 eggs per clutch, up to 3 clutches per year at intervals of about two weeks. On average one female produces 2.3 clutches per year and on average 5.8 eggs per year. In Kazakhstan females lay two clutches and usually 5 eggs per year, the maximum number of eggs per year is 9
Egg size / hatchling size	Eggs are 45 - 50 mm long, 33 - 34 mm wide and weigh between 21 and 25 g
Incubation duration	90 - 105 days
Sex determination	Temperature dependent, the pivotal temperature is near 30 °C, it has not yet been determined precisely
Sperm storage	Probable. Multiple paternity within clutches of several eggs is common

Ranching and Farming in Uzbekistan

The name of the large breeding facility is Zoocomplex – these data have been compiled from literature and from the internet page http://zoocomplex.com/index.php

Maximum length of females	Depending on the abundance of food plants in their habitat 16.25 - 21.73 cm, females from areas at higher altitude are larger due to better food availability
Management of the breeding groups	3 enclosures with a total of > 1.000 tortoises (♂:♀ = 1:3), approximately 1 m^2 per animal, additional feeding with grass and some fruits. Under these conditions the ♀♀ produce usually 1 to maximum 2 clutches, with 3 - 4 eggs per year. Because feeding is not reduced in summer, the tortoises do not estivate, in autumn they directly enter hibernation. Every year in spring the tortoises have to be dewormed
Obtaining the eggs for ranching	The females are caught in areas with high population density, after oxytocin injections they lay 1 - 6, usually 2 eggs. Then they are marked and released back into their natural habitat. Some females have been caught regularly for up to ten years. There is no difference between the eggs from wild caught and captive females
Average size eggs / hatchlings	Zaarmin (400 m asl): Eggs from the first clutch 25.5 g, hatchlings 40.2 mm. Eggs from the second clutch 25.3 g, hatchlings 39.1 mm. Nurata (150 m asl): Eggs from the first clutch 23.2 g, hatchlings 38,1 mm. Eggs from the second clutch 21.7 g, hatchlings 36.8 mm
Incubation	28 - 32 °C, 70 - 80 % relative humidity, first clutches 90 - 110 days, second clutches 75 - 95 days, hatching rate of eggs from captive breeding groups 72 - 75 %, from wild caught

	females (ranching) 68 %, malformations < 1 %, including viable and dead twins
Rearing (7 months)	Daytime temperatures 30 - 36 °C, night temperatures 24 - 26 °C; feeding is five times a week with food containing 21 % protein; stocking density 70 - 80 animals / m^2; mortality during rearing 5 % (mostly within the first month); since hatching is in autumn the tortoises are soaked regularly to prevent them from entering hibernation
Sexual maturity	The tortoises are active year round without hibernation. Under these conditions the first mating activities are observed when they are 3 - 4 years old, fertilized eggs are laid at 5 years of age, but hatchlings are expected only from females that are at least 8 years old
Production	17.000 hatchlings per year, 20 % thereof from captive breeding (C) and 80 % from eggs laid by wild caught females (ranching: R); the juvenile tortoises are exported at about 6 cm CL
Release of captive bred tortoises into the natural habitats	Juvenile tortoises with 6 cm CL have a low survival rate in their natural habitat; In future 3 - 5 % of the hatchlings will be head-started until they reach a CL of 8 cm CL and subsequently released
Distinguishing characters	Farm raised tortoises have less abraded carapace surfaces and therefore a more nuanced coloration than the usually quite even-colored wild caught tortoises

Husbandry and captive breeding

Many of these data are from the publication by JASSER-HÄGER & WINTER (2007) which had used a questionnaire rather similar to the questionnaire we used for theses fact sheets.

First offspring after acquisition	Often the eggs of the very first clutch of imported females (no matter whether imported or captive reared) hatch, but then it will take several years to get the next hatchlings from eggs of that female. After that there are usually hatchlings every year
Breeding in captivity to F2 generation	Yes, several breeders reported F2 or subsequent generations. No specific characteristics of inbreeding like higher malformation rate or color mutations are known from captive breeding in several subsequent generations
Eggs	Usually 1 - 8 eggs per female / year, in exceptionally large females possibly more. In small clutches of 1 - 2 eggs the average egg weight is 24 g, in larger clutches 21 g on average. The eggs of small females (800 g) sometimes weigh only 13 g, but they may still be viable. Minimum egg weight is 11, maximum 28 g

Clutches / year	1 - 4 clutches per year, third and fourth clutches are rare. The interval between clutches is usually only 16 - 18 days. A female produces eggs at 15 % of its own weight
Fertilization rate	The fertilization rate is 90 % when the sexes are kept separate (at optimum temperature range) and there is only a short mating time per year. If males and females are kept together year-round the fertilization rate drops to about 70 %
Mortality	When incubation the eggs under high humidity conditions up to 26 % of the fertilized eggs may die. There is a higher proportion of dead embryos in eggs from females with high egg production. Only about 3 % of the hatchlings show anomalies like extra scutes
Proportion of captive bred tortoises reaching maturity	No exact data: Under good husbandry conditions most of the tortoises will survive to maturity, but with poorly informed keepers, and especially in indoor keeping conditions without hibernation, the mortality may be quite high
Hatchling weight	18 - 21 g, on average the hatchling weighs 5.5 g less than its egg
Longevity in captivity	> 50 years
Incubation duration	At 29 °C and 60 - 70 % relative air humidity ca. 68 days, at 32 °C and 70 - 80 % humidity 59 days. Incubation with a daily temperature cycle takes longer. It can happen that one embryo from a clutch takes up to 14 days longer to hatch than its clutch mates
Incubation temperature	28 - 33 °C
Trigger for reproduction	Mating begins directly after hibernation and is obviously triggered by the raising temperatures. When the sexes are kept separated the males should be active approximately two weeks earlier than the females. Under these conditions the females will be receptive for mating directly after hibernation. Unlike in other *Testudo* species, *T. horsfieldii* has no mating period in autumn. When keeping the sexes together year round keepers report unwillingness to copulate in their tortoise groups, but on the other hand mating injuries occur frequently in this species
Husbandry conditions	Sufficiently large outdoor enclosures with poor, friable soils, the tortoises are sensitive to high humidity conditions. If necessary, provide greenhouses or cold frames
Sex ratio at hatching	The pivotal temperature for a 1:1 hatching rate is not exactly known; it will be near 31 °C when incubating at constant temperatures. If incubation takes place with a more naturalistic daily temperature cycle (recommended!) the daytime temperature should raise to at least 33 °C to produce females. Humidity and CO2 concentration may impact the sexual development of the embryos, and perhaps even the nutrition status of both parents and the nesting date make a difference

Special aspects of the husbandry of this species	Separation of the sexes strongly recommended, the male should be introduced to the female for three weeks after hibernation. The males are aggressive among each other (in nature they are territorial) and the females are not always mutually compatible, too. Food should be low in proteins and high in fiber, and matching the natural growth cycle of the plants, which means much food in spring and a sparse feeding from late spring on, because otherwise the tortoises could get too fat and develop gout. Avoid mixed groups with other tortoise species. Quarantine: At least one year in strict separation is recommended, during this time repeated check for viruses is necessary, and also fecal analyses and perhaps deworming
Estimation of the frequency of captive reproduction	Rather common
Estimation of the difficulty of captive reproduction	Not difficult for well-informed keepers
Care of the young, technical and time effort	In well-structured outside enclosures with greenhouse / cold frame there is not much work for the keeper: Usual health check of the animals, changing the water and in spring giving additional food
Security measures necessary	No, but the tortoises are persistent excavators and agile climbers and they happen to sneak out of their enclosures, even getting quickly over high wire-mesh fences
Sperm storage	Yes, probably several years, but more information is lacking

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A more comprehensive list of references can be found in the appendix.

Beate Pfau & Ronny Bakowskie **07.07.2019**

Appendix

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