

Submitted: 22. 05. 2020

Published: 12. 10. 2020

The Naturalistic Chameleonoculture – a breakthrough in captive management of chameleons Part 1: The NC Foundation and Guiding Principles

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ABSTRACT

On the brief review of chameleon captive husbandry status, a new term, NC – Naturalistic Chameleonoculture, within the frames of Chameleonoculture in general and Herpetoculture is introduced and defined. Under the umbrella of the meaning “As close to nature as possible”, the main guiding principles are declared dealing with the following topics: Space and structure, Behavior, Vital conditions, Lethal conditions, Food, Hydration, Thermoregulation, Reproduction, Conservation, Legal, Limiting stress, Boundary management, Science, Exchange, Education. The metaphorical chameleon rights declaration is presented.

Key words: NC, naturalistic, chameleonoculture, chameleons, husbandry, captive management

PROLOGUE

We live in a world that values science and facts. But, let us not be so strict, as there are things between the earth and heavens. Every heroic story of people that change the world starts the same: A “normal man” lives a “normal life” until something crucial happens, then, the journey begins...

The first time I saw a chameleon was like a fairy tale... It was in a mystical country, which since ancient times housed ancient civilizations. It was on the territory where King Solomon went to visit his love, the Queen of Sheba, the land of frankincense and spices, the Arabia Felix of Herodotos, and the land where Cafe do Mocca was labeled from, passing through the most important port (Mocca, W of Taizz, abandoned nowadays) for the coffee trade in the past centuries... And, it was within the reach of the royal city of Taizz...

Yes, it was in Yemen!

The first chameleon I saw alive in my life was the Yemen Chameleon, *Chamaeleo calyptratus*. And it was a majestic male... Hard to explain what I felt. I do not even remember whether I was breathing that moment. The male was sitting about 2 meters above the ground at the terminal part of an *Accacia* tree branch and was totally calm and just watched me. I remember every millisecond of that encounter.

It was quite symbolic indeed, as if it would be a moment, when a prophecy was spoken out: “This, my dear, this lush green garden in the middle of the high mountains, in the middle of the deserts, in the land of our biblical ancestors and just across Africa yet not in Africa, is the place, where a strange, deaf and dumb messenger, dressed in one of the most colorful dresses in the universe is telling you: this will be your destiny and your life, look at me and listen to me! You will cross deserts, crawl through jungles and climb high mountains to talk to those who do not hear and can not talk. Your mission is to understand though and bring their tidings about the meaning of life to people to understand...”

You can hardly imagine a more mystical moment for a teenager that time... I knew it is an important moment in my life but only now I can understand what was the depth of the meaning it had and has for me... It changed my whole life.

INTRODUCTION

For about three decades chameleons have been gaining in popularity as pets and two species have been established in large numbers in captive populations including *Chamaeleo calyptratus* and *Furcifer pardalis*. Recently, *Furcifer lateralis*, *Furcifer oustaleti*, *Trioceros jacksonii* and *Calumma parsonii* have also been successfully bred in captivity in increasing numbers and other species have been

reported to be propagated in captivity in several generations, such as:

Archaius tigris;
Bradypodion damaranum, pumilum, setaroi, thamnobates;
Brookesia stumpffi, thieli, therezieni;
Calumma nasutum, globifer;
Chamaeleo chamaeleon, arabicus, senegalensis;
Furcifer balteatus, campani, labordi, minor, petteri;
Kinyongia boehmei, matschiei, tavetana, uthmoelleri;
Rhampholeon acuminatus, spectrum;
Rieppeleon brevicaudatus, kerstenii;
Trioceros johnstoni, merumontanus, montium, pfefferi, quadricornis;

and others (P. NECAS 1999, PERS. OBS.; M. BAILEY, M. BARTSCH, S. DECKERS, G. FRITSCH, J. HOLLERAN, J. JANPIERRE, M. JUNGSMANN, N. LUTZMANN, O. MARTINOTTI, M. PAYNE, J. SCHMIDT, W. SCHMIDT, K. STANDFORD, J. VAN OVERBEKE, PERS. COMM.)

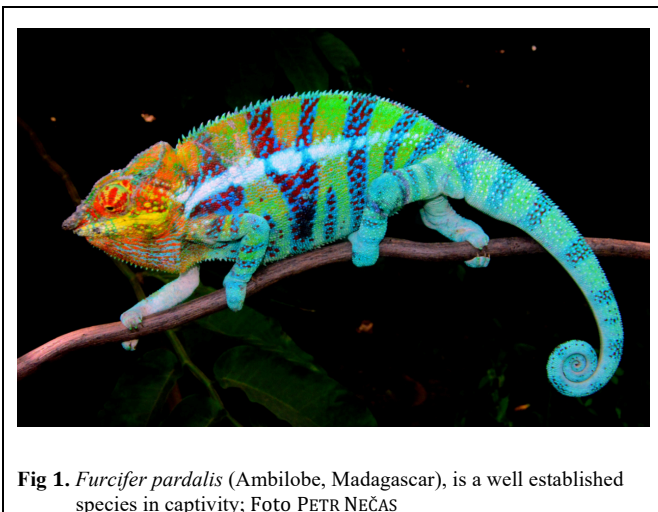


Fig 1. *Furcifer pardalis* (Ambilobe, Madagascar), is a well established species in captivity; Foto PETR NEČAS

While the advanced keepers succeed to keep even the species from the extreme montane or desert conditions in captivity, the layman seem to be merely successful in keeping the two most widespread species for several years only in captivity: *Chamaeleo calypttratus* (only the populations assigned to the nominotypical subspecies, originating from the vicinity of Ibb and Taizz in Yemen) and *Furcifer pardalis* (mainly populations from three localities: Nosy Be, Ambanja and Ambilobe). Long term captive management still represents a challenge even in these two species (though we see them in thousands to appear on the pet market), mainly due to the negative effects of inbreeding in the first species (NECAS & DVORAK 2020) and cross-breeding in the second one (NECAS 2020). Their longevity is also a challenge, as *C. calypttratus* lives in captivity for 3-5 years on average though it can live upto 14 years and the same captive life expectancy or even less applies to *F. pardalis*, being able to reach up to 10 years.

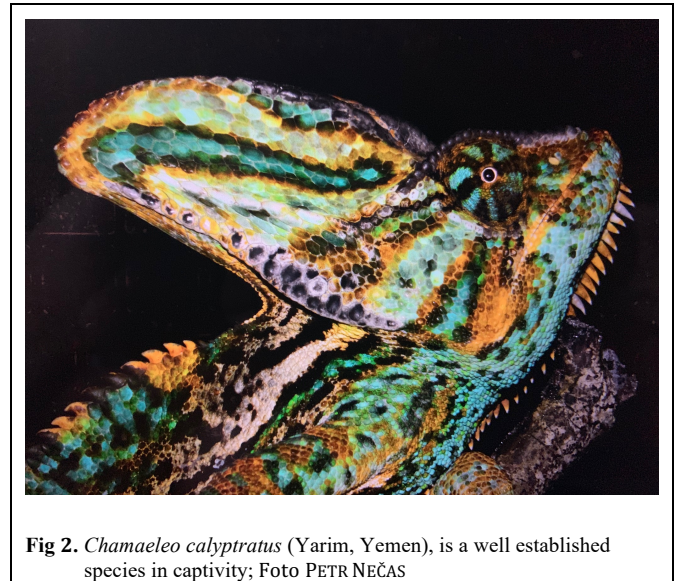


Fig 2. *Chamaeleo calypttratus* (Yarim, Yemen), is a well established species in captivity; Foto PETR NEČAS

While longevity might not be the only factor for assessment of quality of life, it is a good indicator if the life duration and longevity records are in big contradiction (which is the case here). The main reasons are of course wrong captivity management, including overfeeding, malnutrition, overheating and wrong water management. Chameleons, as masters of disguise, keep the symptoms of no-wellbeing not evident for layman eye and once they demonstrate state of heavy illness it is usually too late to turn it back and fatalities are the logical final.

CHAMELEONOCULTURE AS A PART OF HERPETOCULTURE

The origin of the word "herpetoculture" is credited to TOM HUFF, who defined himself as "herpetoculturist" – working to keeping reptiles and amphibians alive and healthy. He separated it from what was his understanding that "herpetologist" of his time were doing – collecting specimens for preservation in museum collections. The word itself is a melt of "herpeto-" of Greek origin where "herpien", which means "to creep", referring specifically to Amphibians and Reptiles, being also the focus of Herpetolog., and the English word "culture" more fostering its meaning "cultivate" than the "culture" as such. (WIKIPEDIA 2020, REPASHY 2017) It was then codified by the AFH: The American Federation of Herpetoculturists as:

1. The interdisciplinary ethnozoological field concerned with the captive husbandry and propagation of amphibians and reptiles.
2. The subculture involved in the captive husbandry and propagation of amphibians and reptiles.

The term herpetoculture was popularized by the Vivarium, and used especially by PHILIPPE DE VOOSJOLI and ALLAN REPASHY gaining the final meaning separating "Herpetoculture" from "Keeping pets" as a multidisciplinary

nary approach of keeping amphibians and reptiles in captivity for the main purpose of their propagation based on correct captive management and conditions. It is further used e.g. by BION in the even more developed term “Responsible herpetoculture” (BION 2019),

CHAMELEONOCULTURE is in that respect an approach of keeping Chameleons in captivity for the purpose of their long-term reproduction and thriving.

THE NC: THE NATURALISTIC CHAMELEONOCULTURE

In the wide field of chameleon husbandry done in many ways, it is necessary to define the NC as the highest possible ambition on Chameleoculture, clearly keeping distance from technological and simplified approaches using fake artifacts, methods and instruments and wrong, not natural materials and methods. In that sense,

NC is an approach of:

- **simulating the vital natural conditions in the undisturbed nature where chameleons live and thrive and**
- **elimination the fatal factors at maximal possible level at same time.**

As new scientific facts appear, and new technologies arise, this is to be understood as a dynamic process, that will further develop, not as a status quo, as our ability to simulate natural vital conditions is clearly driven by knowledge on one side and technical possibilities on the other. The key for success in this approach is the deep knowledge and understanding, not technologization and blank advice.

There are two overruling axioms of NC:

1. **“As close to nature as possible”,**
2. **“In doubt, go safe”.**

All guiding principles of the NC are under the umbrella of these axioms and are as follows:

Respect and rights

NC declares and endorses that any interaction of any human with any other human and animal being it to be respectful. The chameleons are a living entity that deserves respect within the modern understanding of animal rights: “Animal rights is the idea in which some, or all, non-human animals are entitled to the possession of their own existence and that their most basic interests – such as the need to avoid suffering – should be afforded the same consideration as similar interests of human beings.” This principle is traditionally more respected in some cultures, less or at all in some others. In the most developed countries it found even reflection in the legislation. Extremistic interpretations and practices such as those conducted by some international organizations are not meant here, same as I disapprove all animal cruelty practices common till now i.a. in some countries of E and SE Asia and Africa.

Welfare

NC adheres to the principles of animal welfare. Animal welfare refers to the state of the animal; the treatment that an animal receives is covered by other terms such as animal care, animal husbandry, and humane treatment. Protecting an animal's welfare means providing for its physical and mental needs.



Fig 3. *Trioceros deremensis* (E Usambara Mts, Tanzania), is nowadays bred in several generations in captivity; Foto PETR NEČAS

Space and structure

The chameleons must be kept in naturally structured spacious enclosures, which allow them to exhibit all their natural behaviors comfortably and fully, even though in a meaningfully limited way. Bioactivity is not an explicit but possible integral part of the captive space floor arrangement, applicable only if it does not conflict with other simulated features and the space is enough for doing so.

Behavior

The chameleons have the right to exhibit all their natural behaviors comfortably and fully, even though in a meaningfully limited space and way.

Vital conditions

NC endorses providing all vital conditions from the wild, leading to thriving and long life of the chameleon, such as temperature and humidity gradients, seasonality, space, biotope, interaction with living plants, exposition to electromagnetic waves, including visible and invisible light spectrum etc., all based on the science, knowledge of their natural biotopes and life history.

Lethal conditions

NC eliminates all the lethal extremes of the above-mentioned conditions, that would lead to stress, suffering or death of the chameleons. It also meaningfully eliminates any kind (e.g. physical, visual) of the negative influence of the predators, parasites, diseases, disorders and traumas.

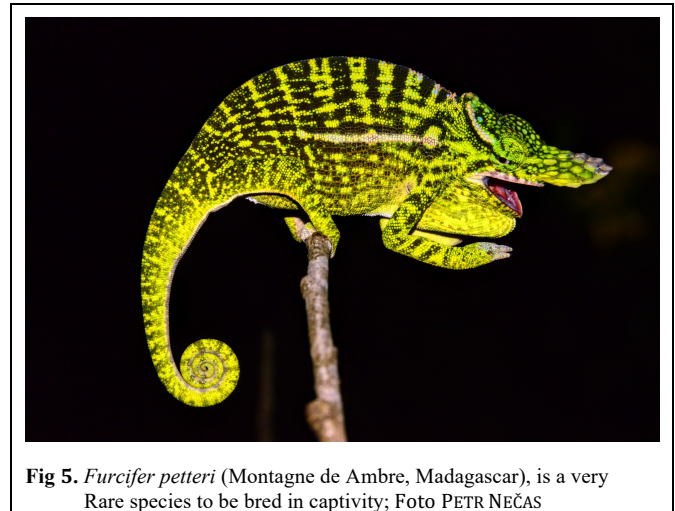
Food

NC endorses providing as natural food as possible concerning its composition, nutritional value, size periodicity and amount, including plant matter (leaves, flowers) and incidentally but regularly swallowed particles (like pollen, dust, soil and natural gut-load of the feeders) and including the possibility to hunt. It strictly absconds from offering unnatural food, which is in the wild naturally rejected and/or poisonous and/or harmful (e.g. some beetles, large locusts etc.) and balances the difference between the natural food and captive available selection of food with meaningful safe supplementation of minerals, vitamins and other vital substances.



Hydration

NC endorses the naturalistic hydration that meaningfully simulates the natural circadian as well as seasonal and annual cycles and events including night fog, clouds, dew, mist and rain. NC absconds from all forms of stressful and forceful hydration (like showering, bathing, forceful drinking), dangerous hydration technologies (e.g. pressurized water entering eyes) as well as from cutting the availability of water causing unnatural level of dehydration and meaningless stress.



Thermoregulation

NC endorses the close-to natural conditions and behavior setup for meaningful thermoregulation within the natural vital range of temperatures and does not forcefully overheat or dangerously undercool the chameleons.

Reproduction

The chameleons have the right to (and the mission of NA is to ensure they will) reproduce in frames defined by the genetic diversity, purity and quality (e.g. absconding from deliberate inbreeding and cross-breeding and reproduction of genetically stunted, ill or suspect individuals), respecting the natural state of things at population level.

Conservation

The chameleons have the right to receive protection of themselves as living being in captivity as well as in the wild, including their natural biotopes, in frames of national and international legislation (e.g. CITES) and beyond, in the sense of highest ethical principles and moral. In case, they need to be removed from a territory, to which they have been introduced, this process must respect the highest ethical standards and any useless killing of animals must be avoided and replaced by any other meaningful methods such as translocation or depositing in captivity.

Legal

NC respects all regulations and laws and acts in compliance with if meaningful; if not proper or under changed conditions, it may initiate legislation changes.

Limiting stress

NC endorses all procedures and handling and treatment being stress-free, or at adequate temporary effective stress level in order to solve a concrete issue.

Boundary management

NC endorses all activities being undertaken by a competent person, who respects legal regulations and boundary management, especially in executing veterinary medicine activities or in use of drugs and medications.

Science

NC commits to science and valid, evidence-based experience, as the only bases for correct strategic decisions relating to chameleons.

Exchange

NC initiates, supports and endorses exchange of all parties in order to respect and execute the mentioned ground principles. It supports publishing of valuable facts in the form of peer-reviewed communications saved safe and accessible way.

Education

NC commits to fulfill a meaningful role in presenting information and education of people in frames of NC and related areas in captivity and in the countries of origin of the chameleons.

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Fig 5. *Kinyongia matschiei* (E Usambara Mts., Tanzania), has been bred in captivity very rarely; Foto PETR NEČAS

EPILOGUE

CHAMELEON RIGHTS DECLARATION

Chameleons do not hear, except of sensing very low tones and infrasound, and can not speak. We deliberately and metaphorically use here an anthropomorphization to demonstrate, what chameleons, in our understanding and belief, would require from humans if it comes to their rights, they would request to be respected.

“I am not property.

I am a living being.

It is not my free choice to be here, but if you respect my rights and give me what I deserve, I am ready to enrich your life.

I have the right to roam freely in an organic environment, and express all natural behaviors, such as climbing, resting, hunting, thermoregulating, reproducing etc.

I have the right to clean air, proper ventilation and humidity; and natural or simulated full-spectrum solar radiation including IR, visible light and UV, as in the wild.

I have the right to a low-stress environment that supports the natural reaction to stimuli, including temperature gradients and hiding places.

I have the right to be fully safe from predators, even in sight, and from all environmental factors and handlings that limit my well-being.

I have the right to grow to a natural size, weight, and structure, consistent with health and longevity.

I have the right to receive knowledgeable management of reproductive behaviors, and a commitment to genetic diversity.

I have the right to nutritional homeostasis and stimulation to hunt, as can be found in nature; and through supplementation, feeder, and hydration management.

I have the right to live a healthy life, free from diseases and parasites, to receive prompt treatment in the case of any health issues, ensuring the best possible quality of life.

I have the right to live as nature intended, and to die without suffering.

I am chameleon.”

(MISKUFF & NECAS 2018, advocating chameleons)

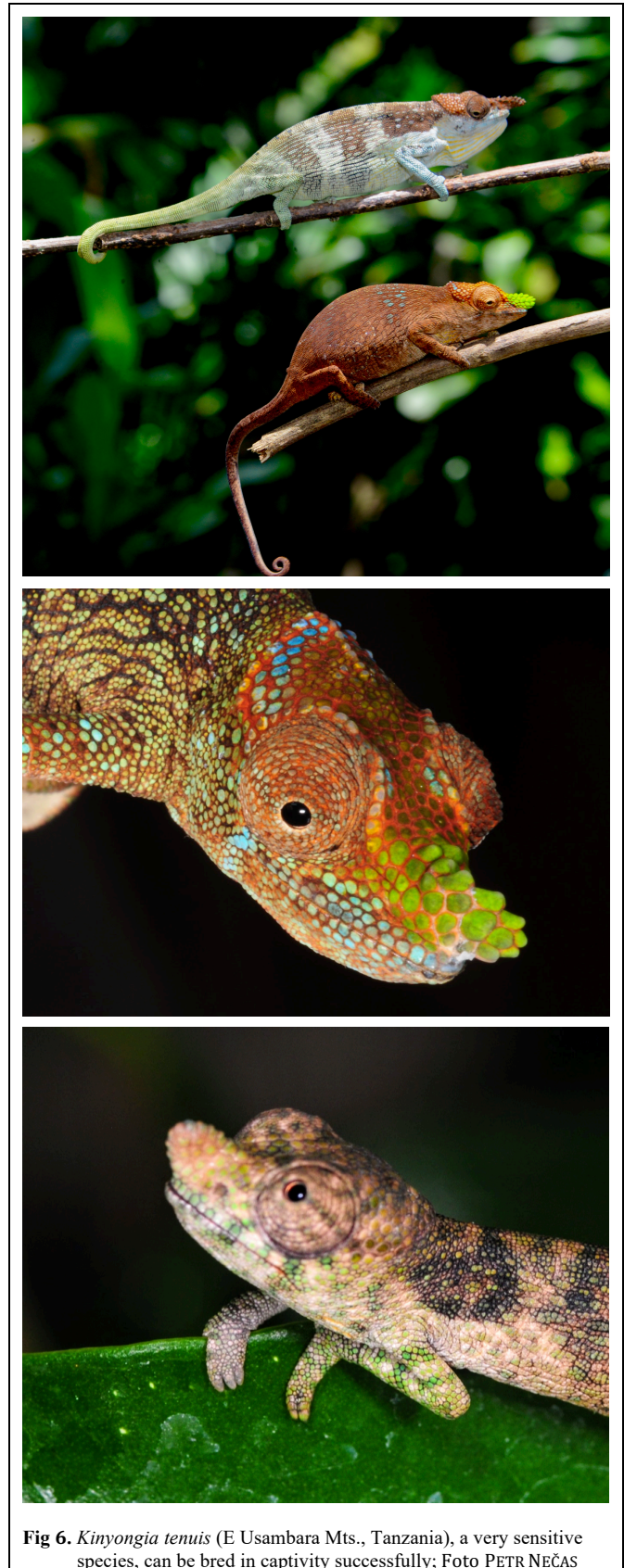


Fig 6. *Kinyongia tenuis* (E Usambara Mts., Tanzania), a very sensitive species, can be bred in captivity successfully; Foto PETR NEČAS