An Annotated Bibliography of the Captive Husbandry, Breeding, Behavior, Veterinary Management and Trade of Tree Monitor Lizards (Varanus prasinus Complex)

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Abstract – Members of the Varanus prasinus complex, commonly referred to as tree monitors, have been maintained in captivity since the 1960s. To date, seven of the nine recognized species comprising this group have been kept and reproduced in captivity. This bibliography provides an extensive compilation of published literature referencing this group in captivity, which should prove useful to zoos and private keepers currently keeping or looking to add representatives of this group to their collections, as well as researchers, veterinary personnel, and wildlife officials monitoring their trade and exploitation.

Introduction

There are currently nine recognized species of varanid lizard belonging to the Varanus prasinus species complex (Ziegler et al., 2007), although the validity of one taxon, V. telenesetes, has recently been called into question (Koch et al., 2014). Commonly referred to as tree monitors, representatives of this group have been known to science since the 19th century, with V. prasinus described by Schlegel in 1839, V. beccarii described by Doria in 1874 and V. kordensis by Meyer in 1874. Yet, unlike several other varanid species such as V. niloticus, V. albicularis, V. griseus and V. salvator which were displayed in zoos and kept in private collections throughout the 19th century (e.g., Anonymous, 1883), it wasn’t until the 1960s that living specimens of this group were first maintained in captivity. This absence of V. prasinus complex animals from living collections was most likely due to a combination of factors, including their remote geographical origins within Indo-Australia, their difficulty to locate and collect in the wild, and the lack of a trade network or supply chain of live reptiles from this region at the time. Additionally, given their frailty and susceptibility to dehydration (Boyer & Boyer, 1997; Card, 1995; Hartdegen, 1997; Kirschner et al., 1996; Salisbury, 2010), it is doubtful that living representatives would have survived the long oceanic transport from their home range to Europe or North America during the 19th and first half of the 20th century.

The earliest known representative to be kept in captivity was V. prasinus, with a single specimen acquired by German herpetologist Robert Mertens in 1960 (Mertens, 1971) that survived for 10 years...
wildlife officials and general enthusiasts with the information presently available on this unique group of varanids. It should be noted that husbandry, breeding and veterinary information presented for one species may be applicable to other species within the complex given their remarkable similarities in size, morphology, ecology and captive requirements.

References


Bibliography of the Varanus prasinus Complex

A brief description of the content presented in each publication is provided at the end of each reference in brackets.

Varanus beccarii


Fischer, D. 2012. Notes on the husbandry and breeding of the black tree monitor Varanus (Euprepiosaurus) beccarii (Doria, 1874). Biawak 6(2): 79-87. [describes husbandry and breeding; also incubation difficulties and egg repair]

Fost, M. 1991. Southeast Asia in southeast USA. Varanews 1(5): 5. [brief mention of V. beccarii being kept at Zoo Atlanta]


Washington 63(2): 261-262. [veterinary report, describes parasite]


Draco 7: 20-29. [describes general husbandry]


Valaoras, G. 1998. Monitoring of Wildlife Trade in the
Varanus boehmei


Varanus keithhornei

Engle, K. undated. Breeding behavior of the canopy goanna (Varanus keithhornei). Unpublished manuscript. 11 pp. [describes in detail husbandry, behavior and successful reproduction at Australia Zoo]
Lemm, J. 1999. In the crocodile’s territory: At home with Steve Irwin. Part one. Reptiles 7(10): 10-21. [mentions Australia Zoo’s retiring of V. keithhornei breeding project]

Varanus kordensis

Since V. kordensis was formerly recognized as a subspecies of V. prasinus and frequently synonymized with the latter by keepers, it is possible that older published accounts (e.g., those preceding Jacobs’ [2002] elevation of the taxon to specific rank) reporting on V. prasinus may actually reference V. kordensis, or both V. prasinus and V. kordensis. The lack of detailed physical descriptions accompanying many of these reports (i.e., differentiating between dorsal ocelli as in V. kordensis or transverse dorsal cross bands in V. prasinus) renders distinguishing which of the two species are being referenced nearly impossible. Nevertheless, due to their similarities in size, morphology, behavior and husbandry requirements, information presented for one species should in most cases be considered applicable to the other.


Fost, M. 1991. Southeast Asia in southeast USA. Varanews 1(5): 5. [brief mention of V. kordensis being kept at Zoo Atlanta]


Spitsin, V.V. (ed.). 2012. Breeding of wild and some...
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Dedlmar, A. 2008. Eine kleine Sensation. Reptilia (DE) 13(1): 8. [describes a bicephalic V. macraei that was hatched in captivity]


Shiau, T.-W., P.-C. Hou, S.-H. Wu & M.-C. Tu. 2006. A
survey on alien pet reptiles in Taiwan. Taiwania 51(2): 71-80. [discusses presence of *V. macraei* in Taiwan trade]

Spitsin, V.V. (ed.). 2012. Breeding of wild and some domestic animals at regional zoological institutions. Information on the Zoological Collections 2012. Informational Issue of the Eurasian Regional Association of Zoos & Aquariums 31: 40-41, 261-264. (In Russian) [documentation of *V. macraei* being kept at Krasnoyarsk Zoo]


Ziegler, T. 2015. In situ and ex situ reptile projects of the Cologne Zoo: Implications for research and conservation of South East Asia’s herpetodiversity. International Zoo Yearbook 49: 8-21. [describes varanid breeding projects at the Cologne Zoo, including *V. macraei*]


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**Varanus prasinus**


Allen, M.R. 1997. Green tree monitors will no longer be exported from Indonesia. Varanosaurus 1(2): 1. [brief claim that trade in *V. prasinus* was to be closed]


Anonymous. 1994. Dierenbestand binnen de NDV/DVA. Nieuwsbrief van de Nederlandse Doelgroep Varanen 1(4): 42. [brief mention of *V. prasinus* kept in Dutch private collections]


Baumer, M. 2011. In the nursery. Herp Herald (Bronx Zoo Herpetology Department Newsletter), Spring 2011: 7. [documentation of successful reproduction at the Bronx Zoo]


husbandry and successful reproduction at the Löbbecke Museum and Aquazoo.


Fost, M. 1993. Fort Worth Zoo reports significant lizard breedings. Varanews 3(6): 3. [documentation of successful reproduction at Fort Worth Zoo]

Garner, M.M. 2008. A retrospective study of disease in...


Hudson, R. 1997. Green tree monitors hatched at Fort Worth Zoo. AZA Communique 24: 22. [documents successful reproduction at the Fort Worth Zoo]


Kuppert, S. 2013. Providing enrichment in captive amphibians and reptiles: Is it important to know their communication? Smithsonian Herpetological Information Service 142: 1-42. [describes behavioral enrichment]


43-45. [description of husbandry and successful reproduction]

Varanus prasinus, V. rudicollis a V. salvadorii v
husbandry, successful reproduction at Prague Zoo,
behavior and veterinary management]

Reháček, I. & P. Velenský. 1998. Prague Zoo, Czech
Republic. International Zoo News 45(283): 118-
119. [documents husbandry, successful
reproduction at Prague Zoo, and veterinary
management]

Lizards: Volume 2. Krieger, Malabar. [presents
general husbandry information]

Salisbury, H. 2010. Keeping and breeding green tree
[describes husbandry and successful reproduction]

Schaftenaar, W., G.M. Dorrestein, J.M.C.H. Mensink
infestation with rhabditid nematodes in a green
tree monitor lizard (Varanus prasinus); diagnosis
and treatment: A case report. 2000 Proceedings
of the European Association of Zoo and Wildlife
Veterinarians: 75-76. [veterinary report, describes
parasites]

[briefly mentions the keeping of V. prasinus in
Australia]

Seizures and prosecutions: Varanus prasinus.
Traffic Bulletin 20(3): 113. [describes the illegal
trade and farming of V. prasinus]

Shuter, A.D. 2014. A novel underwater foraging
behavior observed in Varanus prasinus at the
Wildlife Conservation Society’s Bronx Zoo.
Biawak 8(2): 61-63. [describes foraging behavior
and husbandry]

Spitsin, V.V. (ed.). 2006. Breeding of wild and some
domestic animals at regional zoological
institutions. Informational Issue of the Eurasian
Regional Association of Zoos & Aquariums 25:
103, 227-228. (In Russian) [documents successful
reproduction at Prague Zoo]

Spitsin, V.V. (ed.). 2008. Breeding of wild and some
domestic animals at regional zoological
institutions. Informational Issue of the Eurasian
Regional Association of Zoos & Aquariums 27:
109, 251-252. (In Russian) [documents successful
reproduction at Prague Zoo]

Spitsin, V.V. (ed.). 2009. Breeding of wild and some
domestic animals at regional zoological
institutions. Informational Issue of the Eurasian
Regional Association of Zoos & Aquariums 28: 83,
230. (In Russian) [documents successful
reproduction at Prague Zoo]

Spitsin, V.V. (ed.). 2010. Breeding of wild and some
domestic animals at regional zoological
institutions. Informational Issue of the Eurasian
Regional Association of Zoos & Aquariums 29: 80,
241-243. (In Russian) [documents successful
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Spitsin, V.V. (ed.). 2012. Breeding of wild and some
domestic animals at regional zoological
institutions. Information on the Zoological
Collections 2012. Informational Issue of the
Eurasian Regional Association of Zoos &
Aquariums 31: 40-41, 261-264. (In Russian)
[documents successful reproduction at Prague Zoo]

report on reproduction in captive monitor lizards
(ed.), Captive Propagation and Husbandry of
Reptiles and Amphibians. Special Publication #5.
Northern California Herpetological Society.
[presents some reproductive data]

Sprackland, R.G. 1989. Captive maintenance of
green tree monitors (Varanus prasinus) and their
of the Northern California Herpetological Society.
[presents husbandry information]

discrimination in monitor lizards (Reptilia:
Lacertilia: Varanidae). Bulletin of the Chicago
Herpetological Society 25(10): 181-183. [presents
information on diet and husbandry]

Sprackland, R.G. 1991. The emerald monitor lizard,
Varanus prasinus. Tropical Fish Hobbyist 39(8):
110-114. [provides general husbandry information]

Fish Hobbyist 39(1): 130-138. [provides general
husbandry information]

Publications, Neptune. 288 pp. [describes
husbandry and breeding]

Sprackland, R.G. 1993. Carnivorous lizards and their
on diet]

Sprackland, R.G. 1994. Emerald monitors: Lean,
[provides general husbandry information]


Sprackland, R.G. 2009. Giant Lizards, 2nd Ed. TFH Publications, Neptune. 335 pp. [provides general husbandry and breeding information]


Spitsin, V.V. (ed.). 2012. Breeding of wild and some domestic animals at regional zoological institutions. Information on the Zoological Collections 2012. Informational Issue of the Eurasian Regional Association of Zoos & Aquariums 31: 40-41, 261-264. (In Russian) [documentation of *V. reisingeri* being kept in Eurasian zoos]