

Observation on food items of Asian water monitor, *Varanus salvator* (Laurenti, 1768) (Squamata Varanidae), in urban ecosystem, Central Thailand

Sitthi Kulabtong* & Rujira Mahaprom

Save wildlife volunteer Thailand, Wangnoi District, Ayuttaya Province 13170, Thailand; e-mail: kulabtong2011@hotmail.com (Sitthi Kulabtong); e-mail: Rujira.ma@hotmail.com (Rujira Mahaprom)

*Corresponding author

ABSTRACT

Feeding habit of Asian water monitor, *Varanus salvator* (Laurenti, 1768) (Squamata Varanidae) in urban areas of Central Thailand indicated that this species is carnivorous and scavenger according to the observations data.

KEY WORDS

food items; Asian water monitor; *Varanus salvator*; urban ecosystem; Thailand.

Received 09.07.2015; accepted 22.08.2015; printed 30.09.2015

INTRODUCTION

Asian water monitor, *Varanus salvator* (Laurenti, 1768) (Squamata Varanidae) is the largest monitor in Thailand and the second largest lizard in the world (Shine et al., 1996). Asian water monitor is the most widespread species of all monitor lizards. Distribution range of this species is extending from India Subcontinental to South East Asia, Sunda Islands, and Moluccas (Böhme, 2003; Gaulke & Horn 2004; and Koch et al., 2007, 2010).

Current status of the species can be separated into following subspecies according to Koch et al. (2010) namely *V. salvator salvator* from Sri Lanka; *V. salvator bivittatus* (Kuhl, 1820) from Indonesia, type locality Java; *V. salvator andamanensis* Deraniyagala, 1944 from Andaman Islands; *V. salvator macromaculatus* Deraniyagala, 1944 from Thailand, Peninsula Malaysia, Vietnam, southern China, Hainan, Sumatra, and Borneo and smaller off-shore islands.

In Thailand, Asian water monitor can be found in many ecosystems from hill stream ecosystem, mangrove ecosystem, national park ecosystem to

urban ecosystem. Habitat of this species is semi-aquatic ecosystem. The microhabitat of the species was thermally stable and the species also used burrows for the body temperature control (Shine et al., 1996). Feeding habit and reproductive biology of Asian water monitor were reported in many countries, especially in Sumatra, Indonesia, Shine et al. (1998) reported that, the monitor lizard can eat a wide variety of prey, including vertebrates (e.g. rats, chickens) and invertebrates (e.g. insects, crabs). Reproduction of the monitor lizard is all year-round spawned, with lower intensity in drier months and the monitor lizard can produce multiple clutches of 6–17 eggs each year. In Thailand, the biological data of Asian water monitor, *V. salvator* are poorly known, especially in urban ecosystem.

MATERIAL AND METHODS

The surveys were carried out by direct observation of Asian water monitor, *V. salvator* in many urban areas of Central Thailand during the period January–December, 2014.

The determination of the ingested material was carried directly on the site as observation or transporting food waste is difficult to identify in the laboratory. The observation areas include: green space of Kasetsart University Bangkok Campus and many parks in Bangkok; green space of Silpakorn University Sanamchandra palace Campus, Meuang District, Nakhon Patthom Province; green space of Kasetsart University Kamphaeng Saen Campus, Nakhon Pathom Province; Mueang District, Ayuttaya Province; Meuang District, Chachoengsao Province; Bang Kruai District, Nonthaburi Province and Bang Kachao green zone, Prapadaeng District, Samut Prakan Province (Figs. 1–4).

RESULTS

In the observation zone and in laboratory we surveyed many food products which constitute the basic diet of the Asian water monitor in urban ecosystem of Central Thailand.

Food items can be separated into 17 groups which were Cyprinid fishes, Common suckers, Nile tilapia, Climbing perch, Striped snakehead, Marsh crab, Snail-eating turtle, Chinese edible frog, Chicken, Duck, Waterhen, Myna, Rat, Cat, Dog, food scraps and carcass.

Below is the list of foods classified in detail.

1. CYPRINIFORMES CYPRINIDAE Carp or Cyprinid fish

Cyprinus carpio (Linnaeus, 1758)

Labeo rohita (Hamilton, 1822)

2. SILURIFORMES LORICARIIDAE Common suckers

Pterygoplichthys disjunctivus (C. Weber, 1991)

Pterygoplichthys pardalis (Castelnau, 1855)

3. PERCIFORMES CICHLIDAE Nile tilapia

Oreochromis niloticus (Linnaeus, 1758)

4. PERCIFORMES ANABANTIDAE Climbing perch

Anabas testudineus (Bloch, 1792)

5. PERCIFORMES CHANNIDAE Striped snakehead

Channa striata (Bloch, 1793)

6. DECAPODA GRAPSIDAE Marsh crab

Episesarma spp.

7. TESTUDINES BATAGURIDAE Snail-eating turtle

Malayemys macrocephala (Gray, 1859)

8. ANURA RANIDAE Chinese edible frog

Hoplobatrachus rugulosus (Wiegmann, 1834)

9. GALLIFORMES PHASIANIDAE Chicken

Gallus gallus domesticus (Linnaeus, 1758)

10. ANSERIFORMES ANATIDAE Duck

Anas spp.

11. GRUIFORMES RALLIDAE White-breasted waterhen

Amaurornis phoenicurus Pennant, 1769

12. PASSERFORMES STURNIDAE White vent Myna

Acridotheres grandis Moore, 1858

13. RODENTIA MURIDAE Common rat

Rattus norvegicus (Berkenhout, 1769)

14. CARNIVORA FELIDAE Cat

Felis catus Linnaeus, 1758



Figures 1–4. Asian water monitor, *Varanus salvator* (Laurenti, 1768) in urban ecosystem of Bang Kachao green zone, Prapadang District, Samut Prakan Province, Central Thailand

15. CARNIVORA CANIDAE

Dog

Canis familiaris Linnaeus, 1758

16. Food scraps from households and restaurants, rubbish bin

17. Carcass

CONCLUSIONS

The Asian water monitor, *V. salvator*, are carnivores, and have a wide range of foods. They are known to eat fish, frogs, rodents, birds, crabs, snakes, turtles, young crocodiles and crocodile eggs (Sprackland, 1992; Whitaker, 1981) and garbage (Uyeda, 2009).

According also to these our observations which include a wide range of foods (see above), at present, feeding habit of Asian water monitor, in

urban areas of Central Thailand indicated that this species is carnivorous and scavenger.

ACKNOWLEDGMENTS

We wish to thank the anonymous reviewers for their invaluable editorial advice. A very special thank to Assist. Prof. Dr. Prateep Duengkae, Faculty of Forestry, Kasetsart University, Thailand for providing available data for this species and helping us during the field survey.

REFERENCES

- Böhme W., 2003. Checklist of the living monitor lizards of the world (family Varanidae). Zoologische Verhandeln, 341: 1–43.
- Gaulke M. & Horn H.G. , 2004. *Varanus salvator* (Nominate form). In: Pianka E.R. & King D.R. (Eds.):

- Varanoid lizards of the World. Indiana University Press, Bloomington, Indianapolis, 244–257.
- Koch A., Auliya M., Schmitz A., Kuch U. & Böhme W., 2007. Morphological Studies on the Systematics of South East Asian Water Monitors (*Varanus salvator* Complex): Nominotypic Populations and Taxonomic Overview. In: Horn H.-G., Böhme W. & Krebs U. (Eds.), Advances in Monitor Research III. Merten-siella 16, Rheinbach, 109–180.
- Koch A., Auliya M. & Ziegler T., 2010. Updated checklist of the living monitor lizards of the world (Squamata: Varanidae). Bonn zoological Bulletin, 57: 127–136.
- Shine R., Harlow P.S. & Keogh J.S., 1996. Commercial harvesting of giant lizards: the biology of water monitors *Varanus salvator* in Southern Sumatra. Biological Conservation, 77: 125–134.
- Shine R., Ambariyanto, Harlow P. & Mumpuni, 1998. Ecological traits of commercially harvested water monitors, *Varanus salvator*, in northern Sumatra. Wildlife Research 25: 437–447.
- Sprackland R.G., 1992. Giant lizards. Neptune, NJ: T.F.H. Publications, 61 pp.
- Uyeda L.T., 2009. Garbage appeal: relative abundance of Water Monitor Lizards (*Varanus salvator*) correlates with presence of human food leftovers on Tinijil Island, Indonesia. Biawak, 3: 9–17.
- Whitaker R., 1981. "Bangladesh – Monitors and turtles". Hamadryad, 6: 7–9.