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FOLK KNOWLEDGE AND DISTRIBUTION OF THE KOMODO DRAGON (*VARANUS KOMODOENSIS*) ON FLORES ISLAND

Gregory Forth

The world's largest lizard, the Komodo dragon, occurs not only on its namesake island but also on the far larger eastern Indonesian island of Flores. Since it first became known to western science in the early 20th century, local people have provided information on the species, its ecology, and distribution on Flores. While the lizard's occurrence in westernmost Flores has been known since its discovery by Europeans, this paper reviews recent ethnographic evidence for the continuing presence of Komodo dragons in more easterly parts of north coastal Flores where its occurrence has yet to be verified zoologically or has been documented only recently. Also discussed are the carnivorous lizard's relationship with humans and domestic animals in north central Flores, its place in local symbolism, and different names applied in various parts of the Flores region to the Komodo dragon and another, smaller and sometimes sympatric Varanid, the water monitor.

Key words: Komodo dragon, ethnozoology, ethnotaxonomy, Flores (eastern Indonesia)

Le lézard le plus grand au monde, le dragon de Komodo, vit en Indonésie sur la petite île qui lui a donné son nom, mais aussi sur la grande île voisine située à l'est, Flores. Depuis que l'Occident a noté son existence au début du vingtième siècle, la population locale a transmis des renseignements qui touchent l'écologie et la répartition du dragon sur Flores. Alors que la présence de ce lézard à l'ouest de l'île est connue depuis sa découverte par les Européens, cette étude revoit les récentes observations ethnographiques qui attestent de la présence de dragons de Komodo dans la zone littorale située au nord-est de Flores où son apparition n'a pas encore été vérifiée par des biologistes ou n'a été documentée que tout récemment. Cet article examine également les interactions de ce lézard carnivore avec les humains et les animaux domestiques au Centre Nord de l'île. De plus, notre étude porte sur le symbolisme que lui accorde la population locale et présente les différents noms utilisés dans les différentes régions de Flores pour le dragon de Komodo et pour un autre lézard sympatrique et plus petit, le varan malais de la famille des Varanidés.

Introduction

The Komodo dragon (*Varanus komodoensis* Ouwens), alternatively and arguably more accurately known as the Komodo monitor, is the world's largest lizard (Figure 1). Although familiar to the inhabitants of several Indonesian islands, the giant reptile did not become known to Europeans until 1910, being first described scientifically by P.A. Ouwens in 1912. While the Komodo dragon will opportunistically consume carrion, the animal is nevertheless a capable hunter that regularly preys on large mammals, both wild and domesticated. In fact, the dragon's status as a predator has recently been highlighted by a study reporting the presence of a hitherto undiscovered venom gland with ducts leading to the teeth (Fry et al. 2009). The Komodo dragon also has the distinction of possessing the most restricted range of any carnivore. It is confined to the small eastern Indonesian island of Komodo, the smaller neighboring islands of Rinca, Gili Dasami (also called Nusa Kode) and Gili Motang, and parts of the large island of Flores (Figure 2). In the late 1970s, *V. komodoensis* became extinct

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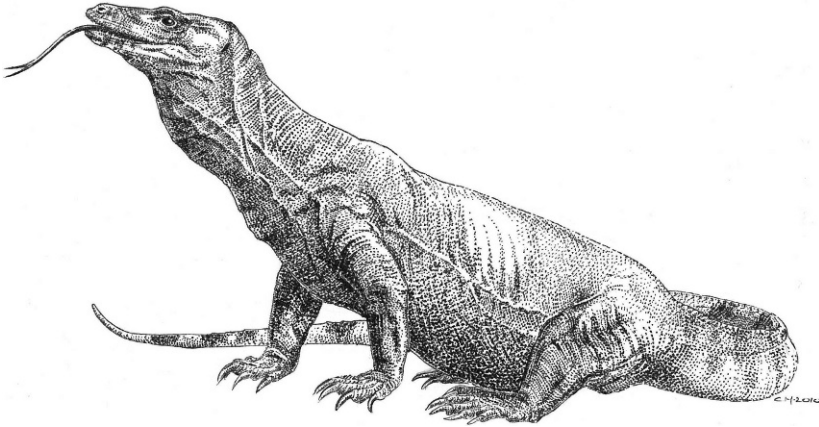


Figure 1. The Komodo dragon, *Varanus komodoensis*. Illustration by Christopher Healey.

on the tiny island of Padar, located between Komodo and Rinca, probably owing to the reduction of deer, its primary prey, from poaching (Ciofi 1999). The species has also been reported from the island of Sumbawa, more specifically from the island's sparsely populated south coast (Van Heurn 1932:76–77), but its present status there remains unclear. There is some suggestion that Komodo dragons are referred to in legendary events located in the Bimanes region of eastern Sumbawa (Hitchcock 1993:315); however that may be, the Bimanes have unquestionably been familiar with *V. komodoensis* from their long connection with Komodo Island (Verheijen 1982).

This paper reviews ethnographic evidence for the occurrence of *Varanus komodoensis* on Flores' north central coast, including parts of the administrative districts (or regencies) of Ngada, Nage-Keo, Ende, and Sikka. All these regencies, it should be noted, extend from the south coast to the north coast of the island. Since the species first became known to western scientists, reports by local people have been an important source of distributional evidence for zoologists (see Auffenberg 1981; Ciofi and De Boer 2004:104, 106; De Jong 1937; Ouwens 1912:1; Van Heurn 1932:76; Verheijen 1982). In this article I extend this ethnozoological resource, drawing mostly on accounts I recorded while conducting ethnographic research in central Flores among people living in the vicinity of Bo'a Wae, the old capital of the Nage colonial district, and in the region of Mbai. I also discuss indigenous knowledge of Komodo dragons, including their possible symbolic significance, and review several Florenese folk nomenclatures pertaining to the

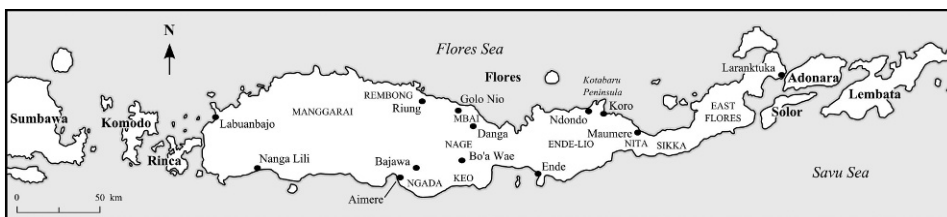


Figure 2. Flores and surrounding islands.



Figure 3. The water monitor, *Varanus salvator*. Illustration by Christopher Healey.

classification of large lizards and consider how these may illuminate local knowledge of *V. komodoensis* and the species' present or recent distribution.

Zoological and Ecological Background

In coastal regions of Flores, the Komodo dragon is sympatric with another monitor, *Varanus salvator*, usually called the water monitor. While widespread in South, East, and Southeast Asia and present throughout Flores and neighboring islands, the water monitor (Figure 3) is absent from the islands of Komodo, Rinca, Padar, Gili Motang, and Gili Dasami. The two species are quite distinct. Mature Komodo dragons can reach a length of over 3 m; in contrast, the Flores sub-species of *V. salvator* is relatively small, rarely growing to more than 1.5 m (Auffenberg 1981:310). With a weight that can approach 90 kg in mature wild specimens (Jessop et al. 2006:246), the dragon is also much heavier than the water monitor and displays a distinctive form, especially the shape of the head and the overall build. When walking or running, Komodo dragons stand higher off the ground than do water monitors. Their colors also differ. While the more arboreal immature specimens of *V. komodoensis* display yellowish markings on a darker background and in this respect may resemble immature and even adult water monitors, mature Komodo dragons are largely a uniformly light brown, brownish-grey, or grey. These morphological differences are important, as they considerably reduce the likelihood that Florenese incorrectly identify specimens of *V. salvator* as *V. komodoensis*. Indeed, wherever on Flores both species are known, people recognize them as distinct and call them by different names (Table 1).

Table 1. Terms for *Varanus komodoensis* (Vk), *Varanus salvator* (Vs) and other Varanids in eastern Indonesian languages.

Cognate sets	Species	Language ¹	Source
SEMBE and cognates			
<i>Sembe</i> or <i>cambe</i> ²	Vk	Riung	Verheijen 1982
<i>Sembe</i>	Vk	Golo Nio	Forth fieldnotes 2008
<i>Sebe</i>	Vs?	Mbai (Danga)	Forth fieldnotes 2008
ETI and cognates			
<i>Eti</i>	Vs	Ende	Forth fieldnotes 1984
<i>Eti</i>	Vs	Keo, South central Flores	Forth fieldnotes 1991
<i>Weti</i>	Vs	Manggarai, all dialects	Verheijen 1967:754
<i>Weti</i>	Vs	Riung	Forth fieldnotes 2008
<i>Oti</i>	Vs?	Sikkanese and Nita	Pareira and Lewis 1998
<i>Udi</i>	Vs	Bimanese	Forth fieldnotes 2008
<i>Ana-udi</i>	Unidentified kind of lizard, possibly a skink	Komodo	Sahidu 1987
<i>Oté</i>	Vs?	Lamaholot, East Flores and the Solor archipelago	Verheijen 1982:77 ³
<i>Ruti</i>	Vs	Wetar	Sanga 2002
<i>Klutis</i>	<i>Varanus timorensis</i>	Tetum, Timor	Stokhof 1983–87
<i>Uti</i>	Vs	Sumbawan, WMP	Mathijssen 1906
<i>Beruti</i>	Vs, specifically a 'young monitor'	Sasak (Lombok), WMP	Verheijen 1967:754
<i>Uti</i>	Vs	Kendari, southeastern Sulawesi, WMP	Goris 1938
<i>O uti</i>	Vs	To Laki, southeastern Sulawesi, WMP	Stokhof 1983–87
ORA and cognates			
<i>Ora</i>	Vk	Komodo and western Manggarai	Verheijen 1982, 1967
<i>Hora</i>	Vk	Central Manggarai, rarely western Manggarai	Verheijen 1967:170; 1982
<i>Horo, oro</i>	Vs	Southeastern Manggarai and Sita	Verheijen 1967:170, 467
<i>Gora</i>	Vs	Rembong	Verheijen 1977:39
<i>Ghora</i>	Vs	Ngadha	Arndt 1961:626 (s.v. <i>yora</i>)
<i>Ghoa</i>	Vs	Nage dialects	Forth fieldnotes 1984–2008
<i>Laghora</i>	Vs	Nage, Bo'a Wae dialect	Forth fieldnotes 1984–2008 ⁴
<i>Lawora</i>	Vs	Kodi, western Sumba Eastern Sumba	Onvlee 1984 (s.v. <i>lawora</i>) Onvlee 1984

Table 1. Continued.

Cognate sets	Species	Language ¹	Source
<i>Lagura</i>	<i>Varanus timorensis</i>	Savunese	Verheijen 1982
<i>Nggora</i>	<i>Varanus timorensis</i>	Rotinese	Verheijen 1982
BOU and cognates			
<i>Bou</i>	Vk	Riung	Verheijen 1982; Forth fieldnotes 2008
<i>Mbou</i>	Vk	Bimanese	Sahidu 1987; Hitchcock 1993
<i>Mbou</i>	Vs	Golo Nio	Forth fieldnotes 2008
<i>Bou</i>	Vs?	Mbai (Danga)	Forth fieldnotes 2008
<i>Bou</i>	Vk?	Nita	Forth fieldnotes 2008
<i>Bou 'uta</i>	Vk?	Sikkane	Pareira and Lewis 1998:27 (s.v. <i>bou</i>) ⁵
<i>Embau</i>	Vk	Bajau, WMP, spoken in western and northern Manggarai	Verheijen 1982
RUGU and cognates			
<i>Rugu</i>	Vk	Central and eastern Manggarai	Verheijen 1967:573; Central Manggarai and Pongkor
<i>Pendugu</i> (from <i>Empo Rugu</i> , 'grandfather rugu')	Vk	West Central Manggarai: Wélak	Verheijen 1982:246
<i>Rugu</i>	Vk	Rembong	Verheijen 1977:146
<i>Ugu</i>	'large monitor'	Lio	Arndt 1933:513; Verheijen 1963:573
Other terms			
<i>Deği</i>	Vs	Lio	Arndt 1933:54; Van Suchtelen 1921:60
<i>Mburu mara</i>	Vk	Ende district, location not specified	Van Suchtelen 1921
<i>Ebu wolo</i>	Vk	Mbai	Forth fieldnotes 2008
<i>Ngebu wolo</i>	Vk	Nage	Forth fieldnotes 2008
<i>Zawa</i>	'rather large (water) monitor; crocodile'	Rembong; Wangka dialect	Verheijen 1977:200
<i>Jawak</i>	Vs, especially an adult monitor	Sasak, Lombok, WMP	Goris 1938; cf. <i>beruti</i> above under <i>ETI</i>

¹All languages are Central-Malayo-Polynesian except where indicated with "WMP" (= Western-Malayo-Polynesian).

²/c/ denotes a sound similar to /ch/ in English "chum."

³*Ana*, also 'child', specifies a small animal. The Komodo term appears to be a Bimanese loan. Under Bahasa Indonesia *biatuak* (monitor lizard, water monitor), Verheijen (1977:140) gives *udi*, *ana-udi*, but this is difficult to reconcile with the fact that the water monitor does not occur on Komodo, and so may be incorrect. More certainly mistaken is Blust's (2002) reference to *ana-udi* as the Komodo name for *V. komodoensis*.

⁴The /r/ has disappeared from most Nage dialects; therefore, *ghora* is the same word as Ngadha *ghora*.

⁵Pareira and Lewis gloss *bou 'uta* as *buaya darat* (land crocodile, a common Indonesian name for Vk). Lewis (pers. comm. November 2008) informed me that the second component of the Sikkane name should be *uta*, without an initial glottal stop, but still meaning 'forest'.

Komodo dragons and water monitors also contrast in habitat, diet, and behavior. Although the two animals co-occur in some coastal regions of Flores, the Komodo dragon favors xeric environments. While dragons range from the seashore to hillside or hilltop locations up to 500 m in elevation, they generally live in ecotonal zones between savannah and monsoon forest (Auffenberg 1981:92, 355). *V. komodoensis* occurs all over Komodo and small neighboring islands. On Flores, the dragon is confined to a narrow coastal strip that runs from the island's southwest corner to its westernmost point and from there to the north coast, along which distribution is rather more discontinuous. By contrast, the water monitor favors mesic environments and occurs all over Flores, from coastal regions to the island's mountainous interior. Being far more numerous than the Komodo dragon, it is well known in most parts of its range. Although all monitor species are good swimmers—the Komodo dragon is able to swim between islands—the water monitor, as its English name suggests, is rarely found far from water. While both species exploit a variety of food sources, vertebrate prey of Flores water monitors includes only rodents, birds, smaller lizards and snakes, amphibians, and fish. By contrast, the Komodo dragon kills large mammals, including deer, wild pigs, and even feral water buffalo and horses. In fact, it has been suggested that the dragon evolved as a hunter of the pygmy elephants (stegodonts) that once inhabited the Flores region (Auffenberg 1981:289). Komodo dragons hunt mostly by attacking sleeping animals and by ambush (Auffenberg 1981:252). Unlike mammalian carnivores, they are incapable of running down prey (Minton and Minton 1973:180), even though they are strong runners and can briefly achieve speeds of up to 20 km/h (Ciofi 1999).

Of the two monitors, only the Komodo dragon poses a threat to humans. During the 20th century, a number of injuries and even deaths were attributed to dragons, especially on Flores (Auffenberg 1981:123, 317–321). More recently, however, the extent of attacks and fatalities has been questioned, and it is now generally agreed that humans are more dangerous to Komodo dragons than the creatures are to humans (Murphy and Walsh 2006; C. Ciofi, pers. comm. June 2009). Both *V. komodoensis* and *V. salvator* can occur in close proximity to human settlements, and both are a threat to domestic animals. But whereas water monitors steal domestic fowls and eggs, only the Komodo dragon preys on larger livestock, especially goats. Beach-scavenging dragons also threaten peoples' livelihoods by eating gutted fish left on beaches to dry (De Jong 1937:191). Throughout its range, the Komodo dragon's main competitors are humans and dogs: feral dogs compete with dragons over both carrion and game while human hunters compete with dragons over game. To counteract livestock depredation, humans also hunt and kill the giant monitors (Auffenberg 1981:315–316). These activities, as well as forest clearance for agriculture and firing of savannahs (Ciofi and Gibson 2006:7), contribute to a continuing decline of *V. komodoensis* populations in most, and probably all, parts of Flores.

Distribution and Local Knowledge

Today *Varanus komodoensis* is rare, officially considered vulnerable and possibly numbers no more than 3,000. In the 1990s the number of Komodo

dragons on Flores was estimated at 2,000 (Ciofi 1999), but today may be fewer than 500 (C. Ciofi, pers. comm. February 2009). Dragon population density is considerably lower on Flores than on Komodo and neighboring small islands, and is probably declining in northern Flores (Ciofi and De Boer 2004:103, 105). Provisions to protect the species began in the early 20th century when the colonial government introduced restrictions on killing and collecting (Burden 1927) and continued in 1980 with the formation of Komodo National Park, comprising Komodo, several neighboring islands, and a part of western Flores.

Walter Auffenberg (1981:37–41), author of the most comprehensive study to date, described dragons on Flores as almost entirely restricted to the westernmost regency of Manggarai, specifically the area including Labuanbajo and extending south and southeastward to Nangalele (more accurately transcribed as Nanga Lili). The lizards are well known to local peoples throughout this area. It is uncertain whether in recent times dragons have occurred in south coastal locations eastwards of Nanga Lili. An Indonesian sea captain from the south-central port of Ende reported to Auffenberg that he had seen a specimen somewhere in the vicinity of Aimere, about 100 km west of Ende, apparently sometime in the mid-20th century (Figure 2). Recent surveys, however, have not revealed Komodo dragons in the vicinity of Nanga Lili, in the region immediately to the west, or near Labuanbajo (Ciofi and De Boer 2004:103–104).

At the time of Auffenberg's survey in 1971, smaller populations of Komodo dragons were known to occur in several narrow and discontinuous strips along Flores' northwest coast east of Labuanbajo to Riung, some 15 km east of the border with western Flores' Manggarai regency. More recently, the official designation of the area around Riung as a nature reserve (named Wolo Thado, or Wolo Tado) has extended protection of the lizards. Auffenberg (1981:41) also described parts of the coast due north of Ende (Figure 2) as appearing "very favourable" as Komodo dragon habitats, although he found no evidence for *V. komodoensis* there. In 1985, however, a survey by the Natural Resources Conservation Office (BKSDA) of the Indonesian Department of Forest Protection and Nature Conservation (PHKA) revealed a population of Komodo dragons in the northeastern corner of the Ende regency, bordering on the Sikka regency, and BKSDA officials captured four specimens in the Detusoko and Kotabaru peninsulas (BKSDA report cited in Ciofi and Gibson 2006:3). By contrast, a survey conducted in the same region by Ciofi and De Boer between 1997 and 2000 failed to observe or capture a single dragon (Ciofi and Gibson 2006). The investigators explain this decline in the northeastern population as owing largely to habitat destruction and reduction in prey density caused by human hunters (Ciofi and Gibson 2006:7).

The 1985 study confirms an unpublished 1928 report by a Dutch colonial administrator named Rookmaker (cited in De Jong 1937), probably H.R. Rookmaker (or Rookmaaker; see L.C. Rookmaaker 1975), that he was informed, evidently by local people, of the capture in 1926 of two Komodo dragons near Ndondo (sometimes transcribed as Dondo). Ndondo lies immediately west of the region referred to in the 1985 Indonesian report as the Kotabaru peninsula (Ciofi and Gibson 2006). Rookmaker also indicated that in the 1920s Komodo dragons further occurred in several parts of Ngada.

Although geographically less specific, of comparable relevance to the question of Komodo dragon distribution along Flores' north central and northeast coasts, is a report by Van Suchtelen (1921:60), an earlier administrator, who indicated that dragons were living in what is now the Ende regency "several generations ago." Local people called the animal *mburu mara* and described it as a large "cayman" living only in forests. (Available lexicographical sources do not permit an analysis of *mburu mara*, but in related languages, *mara* can mean 'dry' or 'dry land'.) This creature "stood high off the ground like a giant iguana" and "would not hesitate to attack humans" (Van Suchtelen 1921:60). Van Suchtelen moreover distinguishes the animal from another "iguana" called *degi*, probably *V. salvator* (Arndt 1933:54; Stokhof 1983:87), which he describes as very common and not exceeding 90cm in length. Both the distinct name and the local description indicate that this information reflected an accurate folk memory of Komodo dragons. On the other hand, recent zoological surveys prove the animals were not just a memory but were still extant in the Ende regency when Van Suchtelen wrote.

In 2008, Nita people in western Sikka told me that giant monitors are still found just west of Koro and not far to the east of Ndondo where Rookmaker reported *V. komodoensis* in 1928. This is also the location of the 1985 and 1997–2000 surveys. In the Nita dialect of the Sikkinese language the lizards are called *bou*, a name related to Sikkinese *bou 'uta* ('*uta* is 'forest'; Pareira and Lewis 1998:27), the probable Sikkinese name for the Komodo dragon. I was told that because of their large size, these *bou* are capable of attacking and killing pigs and goats, in contrast to the smaller and more common water monitors (*oti*), which at most can kill domestic fowls. *Bou* will reputedly also chase humans. According to one informant, *bou* in the vicinity of Koro and the Kotabaru peninsula have been the object of illegal capture in recent years. Although the details were vague, this report raises the question of the extent of illegal trapping of *V. komodoensis* on Flores, and its effect on the species' decline.

Varanus komodoensis in the Nage-Keo Region of Central Flores

Recent research by the author indicates the presence of Komodo dragons beyond these previously identified locations in the new administrative region designated Nage-Keo. Since 1984, I have occasionally recorded statements by Nage people resident in or near the interior settlement of Bo'a Wae that the dragons ranged not only around Riung, but also as far east as Mbai, the north coastal region that includes the estuary of the Ae Sésa river. Other statements suggested a possible extension as far east as Maumere, in the Sikka regency. This confirms an earlier claim by the missionary zoologist J.A.J. Verheijen (1982:246) who cites "trustworthy sources in Riung" to the effect that Komodo dragons occur along Flores' north coast "almost as far as Mbai." This suggested extension of the Komodo dragon range is significant, for if dragons survived until recently and possibly still survive in the Ndondo uplands (or the Kotabaru peninsula), then their survival around Mbai is probable and not imaginary or inspired by popular media or reports from elsewhere. Since the 1980s, people throughout Flores have become familiar with the Komodo dragon from modern media, and

particularly, during the last ten to twenty years, from television. Nowadays, central Florenese visiting the Riung region can observe locally captured *V. komodoensis*, exhibited as a tourist attraction at Torong Padang, about 15 km northwest of the town of Riung, and in Riung town itself. Still, it is unlikely that media images or other modern sources of information have given rise to false reports of wild populations along Flores' north central coast. Indeed, what Nage in Bo'a Wae know about Komodo dragons occurring in central Flores they attribute to stories told by relatives and acquaintances who reside in north coastal regions, some of whom they regularly encounter at the weekly market in Bo'a Wae. Moreover, Bo'a Wae people are quite certain that the giant monitors have never lived in their own territory, located in the center of Flores along the northern slopes of the volcano Ebu Lobo. At the same time, they are very familiar with the water monitor and the similarities and differences between this species and *V. komodoensis*.

While party to occasional Nage conversations about Komodo dragons in the 1980s and 1990s, it was only in 2008 that I began to pay closer attention to local knowledge of the lizards and reports of their eastward extension in northern Flores. My information derives from three sources: (1) Nage people, mostly in the vicinity of Bo'a Wae, who have travelled for work or other purposes to the north coast, mainly the region of Mbai, or who have relatives in Mbai; (2) people from the north coast currently resident close to Bo'a Wae; and (3) life-long inhabitants of north coastal regions I visited in 2008, especially the Golo Nio district and the village of Pére Mése. Johannes Soda Ule, a Nage elder about 70 years of age and a regular informant of over twenty years, is typical of the first category. Soda Ule told me how, during the 1960s, he used to visit Golo Nio, west of Danga, where local people always warned him against travelling through bush or forest, especially at night, for fear of the giant reptiles. At that time, he said, the creatures were still relatively numerous, and people regularly encountered their footprints. Soda Ule thought Komodo dragons were no longer found in this region, owing to forest clearance and expanding human settlement. However, when I visited Golo Nio in 2008, villagers' stories indicated that the monitors, although less common than formerly, still occur there.

Currently designated an administrative "village" (Indonesian '*desa*'), the territory of Golo Nio is physically dominated by a twin-peaked mountain most Nage call Sanga Benga but which Golo Nio people call Wéwo Rowet (Figure 4). Disposed roughly southeast to northwest, the mountain rises a short distance from Flores' northern shore and is located roughly 8 km west of the plain of Mbai and the estuary of the Ae Sésa. The entire area is a hot and largely treeless region where water is in short supply. Especially in the vicinity of Danga, wet-rice cultivation was developed following the construction of a dam on the Ae Sésa in the early 1960s. Golo Nio, however, is too far west to benefit from the dam, and inhabitants rely on dry field cultivation, some arboriculture, livestock (largely goats and sheep), and limited hunting and gathering. So, while pasture and savannah in the plain of Mbai have been converted to irrigated fields, this is not the case in Golo Nio. Accordingly, since the dam's construction, there has probably been less reduction of environments suitable for Komodo dragons here than in Mbai and especially the area around Danga.



Figure 4. The twin-peaked Mount Sanga Benga in north central Flores.

Residents of the village of Pére Mése provided most of the information on Komodo dragons in Golo Nio. The village is located about 2 km from the sea along a path leading inland from the main road, a short distance to the west of mount Sanga Benga. My main informants were the family of Zacharias Limang, an amiable and forthright man born in 1937. Limang is an age-mate and long-standing friend of the aforementioned Johannes Soda Ule, and Limang's younger brother is the father-in-law of Soda Ule's eldest son. (Thus I was introduced to them by an affine and trusted friend who was able to vouch for me and the validity of my research.) According to Pére Mése villagers, Komodo dragons, which they call *sembe*, still survive in their region but are now rare. These they distinguish from *mbou* (the more common water monitor) and *waja* (saltwater crocodile, *Crocodylus porosus*). More familiar with water monitors and crocodiles, Zacharias Limang had only once seen a *sembe*, and then only at a distance. Nevertheless, he and his brothers were able to provide the following general descriptions based on their own experience and reports from other local people.

Sembe skin has a somewhat reddish or reddish brown hue. The creatures can grow to a length of 1.5 to 2 m, including the tail, and large ones have bellies reaching 25 to 30 cm in diameter. Both figures well exceed the same informants' size estimates for water monitors. Referring to a *sembe* he had encountered some 20 years previously on a hillside perhaps 3 km to the east of Pére Mése, one informant estimated the length as 4 or 5 m. Discrepant reports of size similarly occur in accounts by two Bo'a Wae motorcyclists who claimed they simultaneously encountered what sounded like a Komodo dragon near the main north coast road about halfway between Mbai and Riung. According to one man, the animal was about a meter long (apparently not including the tail), but his companion, whom I interviewed separately, described a total length of at least 5 m. European observers also have frequently overestimated the length of *V. komodoensis*. For example, Dutch pearl-fishermen (Ouwens 1912:1) spoke of

animals up to 6 or 7 m long, while Burden (1927:113), who describes the dragons' size as "very deceptive," remarks how one he observed through field glasses "could easily [be imagined] to be twenty to thirty feet long." De Jong (1937:194–197) attributes such exaggeration partly to an impression of great size conveyed by the apparent breadth and bulk of the animal's trunk when first viewed at a distance of 10 to 15 m. Whatever the precise cause, it is of considerable interest that this tendency to overestimate the size of *V. komodoensis* may be perceptually inherent, and need not reflect either the culture or personality of human observers.

Père Mése villagers mentioned two places in particular where Komodo dragons are, or once were, encountered. Apparently referring to holes or burrows serving as the largely diurnal creature's overnight resting places, they described cavities located in a hilly region 1 or 2 km to the west near their ancestral village. Dragons are said also to be found in cavities on the seaward side of the Sanga Benga mountain. At the same time, the lizards are described as sometimes crossing the mountain and entering pastures on the landward side of Sanga Benga, to the south and southeast. Père Mése people pasture goats here, so in 2007, when something began killing the goats, *sembe* were suspected. A group of men then set out to hunt the lizards and speared one somewhere on the seaward (north) side of the mountain. According to Père Mése villagers, *sembe* will kill and consume calves and sheep as well as goats. They did not mention domestic pigs, but for over two decades, by local government order, pigs have been kept in pens inside or near to villages where they are safer. Large adult *sembe* are difficult to hunt with dogs, although smaller specimens can easily be pursued in this way. Another technique is to lure the creatures with poisoned meat; they are then killed either by the poison or by spearing. This accords with Auffenberg's (1981:315–316) findings on the methods for killing Komodo dragons in northwestern Flores, where livestock depredation is also the major reason for hunting them.

Villagers remarked that formerly young Komodo dragons were killed whenever they were encountered, owing to the threat they posed to livestock. My informants know these activities defy government prohibitions on the killing of *V. komodoensis* but as one man observed, when they threaten or destroy livestock action must be taken: "people kill them and keep quiet about it." For this reason, they explained, dragons are now less common than they once were. If Komodo dragons were once more numerous in this region, deliberate extermination by humans may be at least as significant in their decline as habitat destruction. While human settlement generally reduces environments suitable to *V. komodoensis*, swidden cultivation and the spread of savannah, and perhaps also the introduction of livestock in areas suitable for grazing, may facilitate expansion of the dragons' range (Auffenberg 1981:41). As Ciofi (1999) notes, it has yet to be shown conclusively "whether human interference drives Komodos simply to migrate to different areas or to extinction."

Suggesting they are unlikely to confuse the two animals, Père Mése people described several differences between *sembe* (Komodo dragons) and *mbou* (water monitors). Water monitors are much smaller and darker-skinned than the dragons; and while *sembe* are capable of attacking and killing humans, *mbou* are

not. According to villagers, the *sembe's* most dangerous feature is its tail, an idea that accords with Ouwens' attribution of Komodo Islanders' fear of dragons to the "powerful blows" they can deliver with their tails (Ouwens 1912). *Mbou* are also encountered far more often than *sembe* and will occasionally enter human settlements. Contrary to what has been reported for western Flores (Auffenberg 1981:315–316, 321), people claimed that *sembe* do not enter villages and will only kill and consume livestock put out to graze in pastures or near forest. Zacharias Limang seemed to suggest that water monitors could kill small piglets and puppies kept inside villages, but I may have misunderstood him on this point and was unfortunately unable to question him further. On the other hand, he may have referred to incidents where Komodo dragons had killed village animals, but since only water monitors are recognized as entering settlements, he attributed the killings to these instead. Consistent with zoological accounts of *V. komodoensis*, Père Mésé informants further described *sembe* as occasionally entering the sea. Water monitors, they say, only enter bodies of freshwater. Finally, when Komodo dragons are killed, their flesh is never eaten, although no reason was given for this. By contrast, at least some local people consume the flesh of water monitors and consider the meat extremely tasty. Similarly, other central Florenese generally eat and enjoy the flesh.

Komodo dragons and water monitors also differ in their spiritual, mythological, and symbolic significance. My Père Mésé informants mentioned only one fantastic idea about the dragons, a notion that links them, in a zoologically implausible way, with saltwater crocodiles. Villagers say that when large Komodo dragons enter the sea, they engage in battle with crocodiles, and if defeated, return to the dry land and remain *sembe*. But if the dragons prove victorious, they stay in the sea and turn into crocodiles. The Nage of Bo'a Wae have comparable beliefs that some animals, at a certain stage in their lives, will transform into other animals. For example, newborn Russell's vipers (*nipa ba*, *Vipera russellii limitus*) turn into *tuna balo*, an aggressive biting eel, if they enter a body of water immediately after birth, while those that stay on dry land remain vipers (Forth 1998a:279). The Père Mésé belief also recalls a more widespread association of monitors with crocodiles, which I discuss below.

Komodo dragons appear to be similarly absent from religious or mythical representations in other regions where they occur. Verheijen (1982:45) records only one myth from Komodo Island that features the dragon. In this, the giant lizards originated from one of a pair of human twins that was not properly cared for by its parents and so went off into the wilderness. According to a variant of the tale, the human twin was male, and the twin that became a lizard was female, and they were born to a mythical "dragon princess" who had taken a human husband (Astill 2000:2–3). This tradition may be the basis of a Komodo Island belief that, if a dragon is harmed, "its relatives, who have taken the form of human beings, will also fall ill" (Hitchcock 1993:305). Auffenberg (1981:316) states that his "search of the old literature" and questioning of missionaries revealed no "legends or myths" concerning *V. komodoensis*. At the same time, he mentions a story he heard in Manggarai, according to which the dragons originated on Flores and moved to Komodo Island by way of a long tunnel under the sea.

In contrast, the water monitor has a definite spiritual value in Péré Mése. Monitors that enter settlements, particularly if they approach dwellings in search of chicken eggs, are considered manifestations of human ancestors requesting food. What may be done in this event was not made clear, but I suspect that the animal should not be harmed. My informants also related an incident in which someone killed a water monitor. The following day the carcass was found drained of blood and missing its skin, and from this it was determined that the creature had actually been an ancestor, and that a rite should be performed to make amends for the killing.

Péré Mése villagers mentioned extraordinary powers attributed to several other creatures, including giant centipedes, Russell's vipers (*Vipera russellii limitus*), and the *naga* (a mysterious being apparently inspired by the python and reputedly able to confer spiritual powers to favored humans), but not to Komodo dragons. Ironically perhaps, men conduct spirit quests to gain special powers on Mount Sanga Benga, where dragons reportedly live on the seaward slopes. Yet such powers are not conferred by the dragons but by an entity described as a "spirit" or a *naga*, which resides somewhere in the fork between the mountain's twin peaks. Exemplifying a practice not unusual on this mostly Roman Catholic island, a large cross that now stands in the fork of Sanga Benga was erected by a Florenese friar, reputedly to counter the non-Christian spiritual presence in this place.

Folk Nomenclature and Classification

Florenese folk nomenclature and classification potentially facilitate zoological investigation of the Komodo dragon's current distribution and affirm local recognition of the dragon and water monitor as distinct ethnotaxa. Wherever people describe local animals corresponding to *Varanus komodoensis*, they give them very different names from those they apply to the water monitor (*V. salvator*). At the same time, cognates of names applied in some places to *V. salvator* are elsewhere employed for *V. komodoensis* (Table 1). Many of these terms appear specific to Central Malayo-Polynesian languages, which include the majority of the languages documented in Table 1, while a few have apparent cognates in Western-Malayo-Polynesian languages (WMP). Even so, none of the names reflects Proto-Austronesian or Proto-Western-Malayo-Polynesian terms for lizards reconstructed by Blust (2002:120–21).

Table 1 includes names comprising at least five groups of cognates. For convenience, I discuss these with reference to just one (arbitrarily chosen) form of each name. *Sembe* is the most restricted name, used only in coastal regions of north central Flores. It may also be exclusive to *V. komodoensis*. Although I recorded *sebe* as a Mbai term for a "large variety of the water monitor," I am not certain that this gloss is correct. For one thing, *sebe* were described as aggressive and capable of killing dogs, unlike *bou*, which were specified as about 70 cm in length and as "eating only chicken eggs." Although my informant said that neither animal preyed on goats, it seems therefore that, in at least one dialect spoken in the Mbai region, *sebe* and *bou* distinguish *V. komodoensis* and *V. salvator* as they do in neighboring Golo Nio (Péré Mése). I have found no obvious

cognates of *sembe* (or *sebe*, *cembe*) in other Florenese languages or dialects. Owing largely to the long /e/ (*é*, contrasting with *e* pronounced as the schwa) and what would be an unexplained change from /s/ to /h/, it is unlikely that *sembe* is related to Lio *hémbe*, even though the second term also denotes a lizard (see Arndt 1933:138, where *ana hémbe* is listed as “small lizard”).

Eti (*weti*, *oti*, *udi*, *uti*) is exclusive to *V. salvator* (or other smaller Varanids). *Eti* is a widespread term, with cognates occurring in languages of western, central, and eastern Flores as well as in Bimanese, the language of eastern Sumbawa. Among Central Malayo-Polynesian languages, cognates also occur in Flores-Lembata and southern Moluccan languages (see the Lamaholot and Wetar terms, Table 1) and possibly in Timorese languages (e.g., Tetum), as well as in Western Malayo-Polynesian languages of western Sumbawa (Sumbawan), Lombok (Sasak), and southeastern Sulawesi. Since Komodo dragons do not inhabit parts of Indonesia other than Flores and smaller islands immediately west of Flores, it is a reasonable inference that all these terms denote *V. salvator* or another species of *Varanus*.

Almost as widespread as terms related to *eti* are cognates of *ora* and *bou*. In different languages, both terms designate either *V. komodoensis* or *V. salvator* (or another smaller monitor species). Cognates of *ora* denote the water monitor on Sumba and also occur in the languages of Savu and Roti, where the referent is *Varanus timorensis* (Monk et al. 1997:434). Related to the languages of Timor, Rotinese belongs to a sub-group distinct from the languages of Sumba, Savu, and western and central Flores. Therefore, it would appear that a protoform of *ora* either referred more generally to monitors or, since *V. komodoensis* is sympatric with *V. salvator* only on Flores, only to the water monitor and other smaller Varanids. Cognates of *ora* seem not to be found on Sumbawa, where the two monitor species may also co-occur, or may have done so until recently. In fact, cognates of *ora* designate *V. komodoensis* only in western and central Manggarai and on Komodo Island, which, as noted earlier, does not have water monitors. Furthermore, Komodo *ora*, according to Verheijen (1982:115), is one of many loans from western Manggarai. There is, then, a question of how *ora* (or *hora*), if the protoform applied partly or exclusively to smaller species of *Varanus*, came exclusively to designate *V. komodoensis* only in parts of Manggarai.

The term *bou* has an especially interesting distribution. Although in Golo Nio and possibly also in Mbai it refers to *V. salvator*, the name occurs in nearly all languages spoken in regions where the Komodo dragon might be found. These include Bimanese, spoken at the probable western limit of its range, and Sikkanese, at what appears to be the current eastern limit. In contrast to Bimanese and the languages of western and central Flores, Sikkanese belongs to the Flores-Lembata languages, classified within a larger Timor Area group (Wurm and Hattori 1981). Although *bou* is a name for *V. komodoensis* in Riung, according to Verheijen (1982) *sembe* or *cembe* is an alternative usage. Speaking a language provisionally classified as Western Malayo-Polynesian, the Bajau, or so-called “sea nomads,” are settled along the northern coasts of Flores and Bima. Their name for the Komodo dragon, *embau* (Table 1), may be a loan from either Bimanese or a Florenese language. At the same time, *embau* bears an obvious resemblance to the Bajau word for ‘crocodile’, *embo*.

Since quite different names are employed for the Komodo dragon in several places between Bima and Sikka, surviving cognates of *bou* suggest remnants of a once more widespread term, and one which may previously have been employed in Manggarai before being replaced by variants of *ora* or *rugu*, a name I discuss below. It would be interesting to know whether *bou* is reflected in the second component of *ghoa ba'o*, a Nage name for larger water monitors which they distinguish from *ghoa manu*, a probable reference to immature members of the same species. *Ba'o* can denote the spathe of the areca palm or bamboo; but how this sense could relate to larger water monitors is unclear, and Nage whom I asked were unable to elucidate a connection. Whether *bou* has cognates outside of Flores and Sumbawa is similarly uncertain. Even so, names for monitors in several Moluccan languages, including Nuaulu *puo* (Ellen 1993:250) and Kei *bu'u* (Stokhof 1983–87), are suggestive, as to a lesser degree are names found in languages of southern Sulawesi (for example Mori *kimbohu*, Stokhof 1983–87; and Muna *kumbohu*, Van den Berg 1996).

Like *sembe* and cognates, *rugu* has a highly restricted range, occurring as a name for the Komodo dragon only in dialects of Central and East Manggarai and in the Rembong dialects, spoken in the far eastern part of the Manggarai regency. The term, however, is related to Sikkinese *ugu* (Pareira and Lewis 1998:202; Verheijen 1967:573), which denotes the little house lizard (*Hemidactylus* spp.), the smallest of Florenese reptiles. This suggests that *rugu* and *ugu* reflect a protoform that originally referred to lizards more generally, unless for some reason a name for the smallest of lizards became transferred to the world's largest, or vice versa. Of greater interest for the present discussion is Lionese *ugu*, a name that the missionary lexicographer Paul Arndt translated as "large monitor." Unlike Sikkinese, Lionese forms a single sub-group with Manggarai and other languages of central Flores (usually classified within a so-called Bima-Sumba group). It is spoken not only in the Ende regency immediately to the west of the Sikka regency, but also by some populations currently included in Sikka. In addition, Ndondo, where Rookmaker reported *V. komodoensis* as occurring in 1928, is part of the Lio region and is populated by Lionese speakers. Although one cannot be certain, it seems possible that Lionese *ugu* could refer to *V. komodoensis*, as both colonial reports and the 1985 survey testify to the occurrence of Komodo dragons in parts of Flores' north coast where Lionese is spoken.

Other terms for monitors, apparently unrelated to any of the foregoing, include Lionese and Endenese *degi*, 'iguana', a name that, as mentioned earlier, evidently refers to *V. salvator*. The scientifically inexact term 'iguana' (in German and Dutch "Leguan" and "leguaan") was the word Europeans usually applied to Indonesian monitors during the colonial period. For Lionese, another term Arndt (1933:270) partly translates as 'iguana' (or 'speckled iguana') is *naga*, which he further glosses as 'snake' and 'dragon'. In all likelihood, however, Lionese *naga* more specifically refers to the mythical creature, a form taken by a spiritual being known throughout Flores, including Sikka and the Nage region (Forth 1998b:88–98), and, as mentioned earlier, in Golo Nio.

A Note on Monitors and Crocodiles

As illustrated by the Golo Nio belief that Komodo dragons can transform into saltwater crocodiles, monitors are associated in a particular way with the Crocodylidae both in eastern Indonesia and elsewhere. Selangor Malays claim that crocodile hatchlings that run in the direction of dry land are eaten by their dams, while any that escape turn into monitor lizards (Skeat 1900:289). The same connection is expressed by the Malay and Indonesian national language term *buaya darat*, or 'land crocodile', which is widely applied to large monitors, and on Flores refers especially to the Komodo dragon (see Ouwens 1912:1, who was probably the first to record this Malay name for the creature). Similarly, in Tetum, *lafaek rai-maran*, 'dry land crocodile', denotes a "large lizard" (Hull 2001), almost certainly a monitor, and some Nage employ *ngebu wolo*, 'hill, upland crocodile', for *V. komodoensis*. Nage informants suggested that the last term might be a loan translation of *buaya darat*, an interpretation consistent with the fact that *wolo* (hill) can contextually mean 'dry land' (*darat*). Even so, a more direct source may be the Mbai contrast of *ebu wolo* and *ebu ae*, referring respectively to the Komodo dragon and the saltwater crocodile (*ae* is water). As noted earlier, people in the Ende regency similarly described the Komodo monitor to Van Suchtelen (1921:60) as a "cayman" living in forests. Finally, Rembong *zawa* appears to mean both 'crocodile' and 'large monitor'.

Much further afield, monitors and crocodiles are also associated in parts of Africa. According to one interpretation, the connection is reflected in the English name 'monitor'. With reference to the word's primary sense of "something that reminds or gives warning," one entry in the Shorter Oxford English Dictionary (SOED 1973) defines "monitor" as "a lizard of the family Monitoridae or Varanidae inhabiting Africa and Australia supposed to give warning of the vicinity of crocodiles," although where this seemingly fantastic belief comes from is not indicated. According to another, probably apocryphal interpretation, "monitor" derives from a misunderstanding of the Arabic name for monitor lizards, *waran*, from which the genus name for monitors is derived (*Varanus*; see also Varan, "a lizard of the genus Varanus or family Varanidae," SOED 1973). Supposedly an unidentified German misconstrued German "*Waranechse*," a compounding of "*Waran*" and "*Echse*" (German for "lizard") as "*Warnechse*" (or "*Warneidechse*," both meaning "warning lizard"), a term that was subsequently translated into English as "monitor lizard" and then simply as "monitor" (Minton and Minton 1973:172). Whichever interpretation one accepts, folk beliefs linking monitors and crocodiles are evidently based on physical similarities and the fact that monitors are generally found in the vicinity of rivers and other water sources—in Australia and Africa as well as Southeast Asia—where crocodiles also occur.

Concluding Remarks

Despite their physical resemblance, the relation between Komodo dragons and crocodiles is not ethnotaxonomic, that is, eastern Indonesians do not

consider monitors as members of a crocodile taxon or a taxon that includes both crocodiles and monitors but not other lizards. Not surprisingly, in Nage and other parts of central Flores, *V. komodoensis* is recognized as morphologically most similar to *V. salvator*, although people familiar with both species always call the two lizards by different names. Among Nage, water monitors (*ghoa*) figure as the most focal member of a group of separately named lizards that form an unnamed, covert category, if not a covert taxon. The crocodile, on the other hand, which like *V. komodoensis* is now known to Nage only from other parts of Flores, is marginal to this category, if included at all.

In several Indonesian languages, separate terms or compounds also distinguish mature and immature or larger and smaller water monitors. For example, Nage distinguish *ghoa ba'o* from *ghoa manu*, Rembong *zawa* contrasts with *gora*, and Sasak *jawak* differs from *beruti* (Table 1). These distinctions introduce a complication in adducing nomenclature to support the current or recent presence of *V. komodoensis* in central and eastern Flores, for they raise the possibility that other pairs of terms—for example, Lionese *ugu* and *degi* and Sikkhanese *bou'uta* and *oti*—rather than distinguishing different monitor species, refer instead to mature and immature *V. salvator*. Yet there are no other grounds for suspecting that Florenese mistakenly identify *V. salvator* as *V. komodoensis*, and even less that reports of encounters with Komodo dragons reflect something entirely different or completely imaginary. As shown in the case of Golo Nio, villagers represent the creature they call *sembe* in a thoroughly naturalistic way, the belief about their transformation into crocodiles notwithstanding. They are fully aware of morphological and behavioral differences between *V. salvator* and *V. komodoensis*, and they regard *V. komodoensis* as locally rare, which it must indeed be.

The spiritual contrast between the Komodo dragon and other locally known large reptiles exemplifies a more general phenomenon whereby better known animals are subject to a more fantastic, symbolic, or mystical representation than are less familiar animals, which are encountered occasionally or are known only from verbal reports (cf. Forth 2008:146). Indications that symbolic representations of Komodo dragons are more prevalent on Komodo Island, where the animals are far more common than on Flores, underscore this point. At the same time, zoologically plausible or accurate local descriptions, in this case of what is apparently *V. komodoensis* in north central and northeastern Flores, provide evidence for the veracity and empirical validity of folk zoological knowledge in general. This applies not only to representations of rare species but of all animals, since fantastic representations are typically contextual and need not unduly affect empirical knowledge, especially where such knowledge has technological value in relation to local livelihoods. In a cross-disciplinary vein, local knowledge and nomenclature indicating the occurrence of Komodo dragons where this has not been established scientifically could contribute to future zoological investigation of hitherto unknown populations. As shown, local accounts by people in the Nage-Keo regency point strongly to the occurrence of extant dragon populations in places between zoologically documented sites in Riung and the Kotabaru region (including Ndongdo and Koro), and most notably in Golo Nio. Apart from its ethnographic and linguistic value, information on folk

nomenclature can be an important resource when questioning local people about the most appropriate sites for conducting zoological surveys. With regard to both names for the dragons and local experience of the creatures, ethnozoological knowledge can therefore contribute substantially to the protection and survival of this remarkable species.

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