

Z. Säugetierkunde 58 (1993) 378–380  
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ISSN 0044-3468

## First records of the Malay civet, *Viverra zangalunga* Gray, 1832, on Seram with notes on the Seram bandicoot *Rhynchomeles* *prattorum* Thomas, 1920

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*Receipt of Ms. 12. 10. 1992  
Acceptance of Ms. 14. 6. 1993*

The Malay civet (*Viverra zangalunga*) is widespread in South East Asia, having been recorded from peninsular Malaya, Palawan, Sumatra and neighbouring islands, Borneo, Sulawesi, Buru and Ambon (HONACKI et al. 1982; PAYNE et al. 1985; VAN STRIEN 1986). In part its island distribution has arisen from human introductions as a consequence of the trade in live civets for their musk (GIJSELS 1872). This parallels other deliberate introductions in Indonesia of rusa deer (*Cervus timorensis*) and wild pigs (*Sus scrofa*, *S. celebensis*) for meat (GROVES 1976) and incidental introductions of several species of commensal rodents and the house shrew (*Suncus murinus*) (LAURIE and HILL 1954).

On 3rd September 1990 an adult male Malay civet (National Museum of Scotland, Zoology, NMSZ no. 1990.129.1) was collected at 2,200 m near Wai Huhu (River Huhu) (3° 7' S, 129° 28' E) on the north side of Gunung Binaiya, central Seram, Maluku Province, Indonesia. This is an area of disturbed montane forest with a good understorey of tree ferns, ferns and bracken. It is used regularly by people from the village of Kanikeh (3° 6' S, 129° 27' E) as a camp-site during hunting trips. As a result considerable disturbance is caused by human hunters to this area in the provisioning of wood and other vegetation for fires and the building of temporary shelters. The following morning an adult female Malay civet (NMSZ 1990.129.2) was collected at the same site. The uterus contained three well-developed fetuses, two in the left horn and one in the right horn.

On 14th August 1991 another adult female Malay civet (NMSZ 1992.10.25) was collected during the night at the same locality, suggesting that this species is well established at this altitude. The uterus contained a single well-developed foetus in the right horn. Gut contents included insects (mostly crickets), unidentifiable plant matter and small mammal fur, which was probably from *Rattus exulans* and/or possibly *Suncus murinus*. Although carnivores generally avoid eating shrews because they are distasteful, small numbers are occasionally recorded in their stomachs and scats (see KITCHENER 1991).

A juvenile male Malay civet (NMSZ 1992.10.26) was shot by local police on 25th August 1991 in the town of Wahai on the northern coast of Seram (2° 48' S, 129° 28' E), thereby confirming the presence of this species from sea-level to 2,200 m. Gut contents included invertebrates (crickets and centipedes), fruits and other plant matter. The stomach contents of both civets (NMSZ 1992.10.25–26) were similar to the food items found in the scats of Malay civets in Sarawak (MACDONALD and WISE 1979). Predissection body weights and measurements of all civets collected on Seram are given in the table.

These results confirm recent suggestions that the Malay civet might be present on Seram (ELLEN 1972). This is not surprising given the presence of this species on the neighbouring islands of Buru and Ambon (HONACKI et al. 1982; VAN STRIEN 1986). However, it is also evident that the Malay civet has been on Seram for some considerable time and is not a recent introduction. In Seram this species is known by the Bahasa Indonesia word

Body measurements and weights of the Malay civet, *Viverra zangalla*, on Seram, Indonesia

Register no.	Sex	HB (mm)	TL (mm)	HF (mm)	Body weight (kg)	Locality
1990.129.1	M	650	320	70	3.20	Wai Huhu
1990.129.2	F	670	290	95	3.80	Wai Huhu
1992.10.25	F	645	250	93	3.38	Wai Huhu
1992.10.26	M	435	230	83	1.25	Wahai

HB – head and body length; TL – tail length; HF – hind foot length.

“Musang”, but the people of Kanikeh call it “Makulele” and consider it to be a common animal. These four specimens represent the first records of this species on Seram (LAURIE and HILL 1954).

The palm civet (*Paradoxurus hermaphroditus*) is also recorded from Seram (LAURIE and HILL 1954) and is known to local people as “Tupai” or “Tosia”, although it was not recorded during fieldwork in 1990 and 1991. The palm civet is also known as “Tingalong”, which bears a striking resemblance to “Tangalung”, which is the Malay name for the Malay civet (PAYNE et al. 1985). However, it is possible that the name “Tingalong” is used for both species of civet on Seram, because people in Wahai referred to the young male Malay civet by this name.

Attempts were also made to discover any trace of the endemic bandicoot, *Rhynchomeles prattorum*, which has not been recorded since its discovery by the PRATT brothers in 1920 (THOMAS 1920). Indeed, ARCHER (1984) believes that *Rhynchomeles* is completely extinct. In 80 trap nights in the study site described above and a lower one at 1,800 m altitude no bandicoots were caught. There was also no sign of bandicoot activity in and around the two study sites despite extensive searches.

There are three possible hypotheses to explain the absence of *Rhynchomeles*: 1. complete or local extinction caused by introduced predators including the Malay civet, 2. competition from other introduced mammals and 3. habitat disturbance caused by human activity.

The records of the Malay civet on Seram and its familiarity with local people suggest that it is a well-established member of the mammal fauna and that any decline in numbers of endemic mammals would have been expected to occur possibly hundreds of years ago when this species was actively traded (GIJSELS 1872). Feral cats and dogs represent more competent predators, the latter having been present on Seram since about 3,000 years BP (ELLEN 1993). Therefore, predation is unlikely to have caused a recent extinction of *Rhynchomeles*.

Only house shrews (*Suncus murinus*) and Polynesian rats (*Rattus exulans*) were caught during 340 trap nights using a variety of trap sizes ranging from Longworth small mammal traps to Tomahawk live traps up to 45 cm × 45 cm × 125 cm. The trapping success for both species (4 %) was similar to that recorded in similar habitat on Biliran Island in the Philippines (HEIDEMANN et al. 1987). Although both these introduced species are normally commensal with humans (e.g. LAURIE and HILL 1954; LEKAGUL and MCNEELY 1977; CORBETT 1978; MUSSEY and NEWCOMB 1983), on Gunung Binaiya they are feral. Similar feral populations have been recorded on the islands of Biliran and Negros in the Philippines irrespective of the presence of endemic mammals (HEIDEMANN et al. 1987). It seems likely that these introduced mammals have filled vacant niches on Seram rather than forcing out endemic mammals. This is supported by MUSSEY and NEWCOMB (1983), who found that Polynesian rats were closely tied to human settlements in the rest of the Malay region.

Conversations with people from villages on and around Gunung Binaiya suggest that the Seram bandicoot may still survive in the undisturbed montane forest on the Merkele

Ridge to the west of Kanikeh (ELLEN 1972; MACDONALD et al. 1993), despite claims that it is already extinct (ARCHER 1984). This suggests that habitat disturbance caused by human activities may be locally excluding *Rhynchomeles* and other endemic mammals.

### Acknowledgements

We gratefully acknowledge the financial support of the Wellcome Trust, the Carnegie Trust for the Universities of Scotland, the National Museums of Scotland, the University of Edinburgh, the Royal Zoological Society of Scotland and the Balloch Trust. We thank Dr. PAUL CHANIN for the loan of mink traps. We are also very grateful to the many people too numerous to mention in Indonesia and Britain who made this fieldwork possible.

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Jahr/Year: 1993

Band/Volume: [58](#)

Autor(en)/Author(s): MacDonald Alastair A., Kitchener A. C., Clegg Tamsin, Wiik H.

Artikel/Article: [First records of the Malay civet, \*Vierra tangalunga\* Gray, 1832, on Seram with notes on the Seram Bandicoot \*Rhynchomeles prattorum\* Thomas, 1920 378-380](#)