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Manuscript received: 23 January 2006

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SALAMANDRA	42	2/3	187-190	Rheinbach, 20 August 2006	ISSN 0036-3375
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On the status of *Malacochersus tornieri* (SIEBENROCK, 1903) in Zambia

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Abstract. The pancake tortoise *Malacochersus tornieri* is recorded for the first time from north-eastern Zambia. A two weeks study was carried out during the rainy season 2003 in hilly areas with kopjes (rocky outcrops), which are typical habitats for the pancake tortoise. Sixty-eight (66+2) individuals were sighted, captured, marked by toe clipping and released. Only two individuals were captured twice.

Key words. Chelonia, Testudinae, *Malacochersus tornieri*, distribution, Zambia.

The range of the pancake tortoise, *Malacochersus tornieri* (SIEBENROCK, 1903), as described in CITES Appendix II, was thought to be restricted to Tanzania and Kenya (e.g. KLEMENS & MOLL 1995, SPAWLS et al. 2002). However, WANDERA (2000 in litt. to IUCN)

suggested the species might also occur in Mozambique and Zambia and justifies this with the high numbers of exports of the species reported by CITES from these non-range states (CITES COP 11). However it seems to be that an assignment of the high numbers of

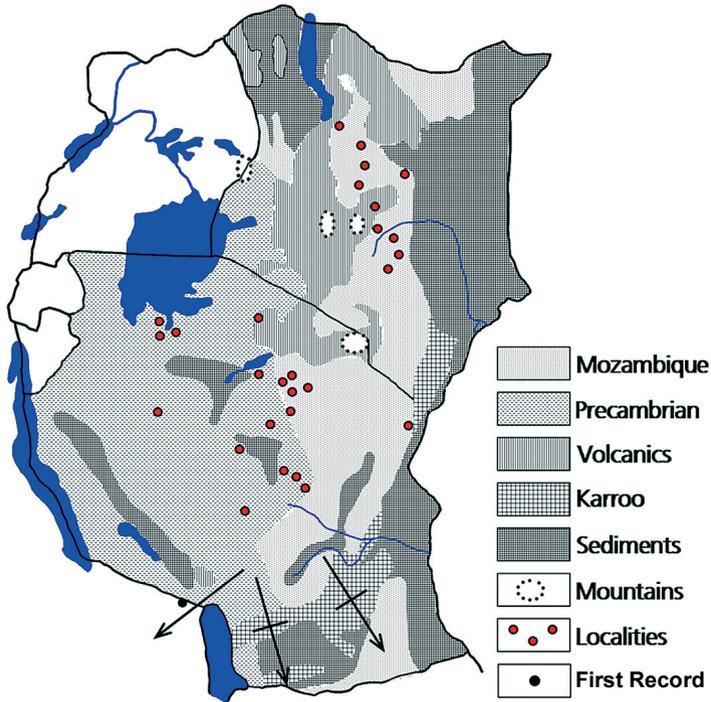


Fig. 1. Map showing different soil domains and the distribution of *Malacochersus tornieri* in eastern Africa.

exports from these countries are due to specimens being smuggled there from Tanzania, notwithstanding any possible occurrence of the species there. In Zambia for instance, the demand for permits from traders for the live exports of Pancake tortoise increased over the years from 400 in 1996 to 10,000 by 2000 (ZAWA 2000). Against the background of the uncertain distribution, a survey was undertaken to investigate the existence of the species in Zambia.

Malacochersus tornieri is a characteristic species of the Somalia-Masai floristic region, an arid semi-desert characterized by *Acacia-Commiphora* bushland and *Brachystegia* woodland in upland localities (WHITE 1983, BROADLEY & HOWELL 1991) and is only found in dry savannah of low altitude at small rocky hills of the crystalline basement. They shelter between rocks and in crevices,

and are normally never found far from these formations. WHITE (1983) believes that the taxon may also be found in the Zambezian floral region, if suitable habitats are present. *Malacochersus tornieri* apparently exist in two large disjunct populations. The Kenyan one ranges from Mt. Kulal in a narrow strip south to the area around Mt. Kenya and Tsavo NP (MALONZA 2003). The second area of distribution exists in central Tanzania from Tarangire and Lake Manyara south to the Ruaha National Park (SPAWLS et al. 2002). There are two additional isolated records from Tanzania: Serengeti and Smith Sound (a long inlet of Lake Victoria just west of Mwanza), these populations may be connected with the central Tanzanian population (SPAWLS et al. 2002).

The Zambian study was conducted in the hilly areas of the Nakonde district in North-

ern Zambia, bordering Tanzania and located at 09° 23' – 09° 24' S and 32° 48' - 32° 51' E with an elevation from 1000 to 1560 meters above sea level. The survey was carried out during the rainy season from 10–23 December 2003. A total of 66 individuals were collected. Two individuals were captured twice. Voucher specimens are deposited at the scientific collection of the Livingstone Museum, Livingstone, Zambia (NMZL 1965, 1966). The number of specimens per site ranged from two to 25 individuals giving an average figure of 8.5 individuals per site and 11 individuals per km². In comparison with MALONZA (2003) who found a highest density of 8.86 individuals per km² the population is comparatively stable, considering that there is no protection of the area by the Zambia Wildlife Authority. The Zambian records are found under differing rainfall and altitude regimes to those in Kenya and Tanzania. Referring to the data given by KLEMENS & MOLL (1995) and MOLL & KLEMENS (1996), the Zambian population inhabits higher altitude areas with rainfall over 1000 mm per year. The suitable boulders and rock outcrops (“kopjes”) were generally confined in this study to areas above 1400 m altitude. At lower elevations, human activity has modified the environment, rocks being broken down, physically removed and piled up to create kilns for the production of charcoal. At higher levels, charcoal production is limited because suitable trees (with a desirable girth usually greater than 50 cm at 1.3 m above ground level) are confined to lower levels, thus the transportation of charcoal sacks would impose severe physical strain on the producer. This minimizes human disturbance at higher elevation. Ninety-eight percent of Nakonde District has been deforested through land clearance for agriculture, firewood collection and charcoal production, the latter being a major income-generating venture (WORLDVISION 2006). It is also possible that *M. tornieri* used to occur at lower altitude, but have been exterminated or pushed higher due to the landscape modifications.

As shown in figure 1, the Kenyan population is associated with the geological formation of the so called Mozambique-belt, a pre-Cambrian rock formation in Eastern Africa. Additionally, the Tanzanian population is associated with other pre-Cambrian rocks in western parts of the country. There are only a few records from volcanic formations, e.g. the Mount Kulal in Kenya. In contrast to pre-Cambrian formations, sedimentary areas, which lack kopjes or rock formations, do not provide the suitable habitat for the species and can be regarded as a distribution barrier. Such a sedimentary barrier exists north-east of Lake Tanganyika. However, between this barrier and Lake Malawi, a Pre-Cambrian basement corridor exists, at the end of which our new record is situated. Considering this distribution pattern it is not surprising that the species also occurs in Zambia. The distribution map shows the isolation of the Zambian population; further investigation and DNA analysis will be required to compare the Zambian with the Tanzanian and Kenyan populations. Another barrier of sedimentary and karroo (mostly flat-lying sediments, from the Permian) formations is located in southern Tanzania. A corridor to the southward, reaching suitable Pre-Cambrian formations in Mozambique does not seem to exist. Because of this, the occurrence of *M. tornieri* in Mozambique is questionable (see arrows, fig. 1).

It was observed during this study that the major threat to the pancake tortoises in Zambia is the illegal collection for international trade. Implementation of the national legislation and CITES convention has been hampered by shortage of staff and finances. We suggest that the Government of the Republic of Zambia consider introducing a captive breeding program as a backup to an *in situ* conservation, because as long as the population only occurs in an unprotected area, the conservation of the species will be a difficult issue. Consequently, we support the petition of Kenya and the USA to place *M. tornieri* in CITES Appendix I.

Acknowledgements

We owe our thanks to the Management of Zambia Wildlife Authority (ZAWA) in general and the United Nations Development Program (UNDP) for the financial assistance provided. We also thank GEORGE KAMPAMBA of Zambia Wildlife Authority for his support during the study, our fellow workmates in the department of research for their support during and after the task. Mr. SIKOMBE, of Nakonde town, for the logistical support in the field. The distribution map is based on the map provided by SPAWLS et al. (2002); we thank the authors for permission to use it. We thank WOLFGANG BÖHME, MARK AULIYA, ANDREAS SCHMITZ and very specially STEPHEN SPAWLS for the critical review of an earlier draft of this paper.

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Manuscript received: 6 June 2006

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