

REVISED DISTRIBUTION OF THE AFRICAN FRESHWATER CRAB
GENUS *DECKENIA* HILGENDORF, 1868 (BRACHYURA, POTAMOIDEA,
DECKENIIDAE)

BY

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African freshwater crabs are a typical example of taxa for which the archival aspect of museum collections has played a vital role in obtaining insight in species diversity and distribution patterns. For instance, initiatives that aim to assess and safeguard biodiversity of freshwater habitats in eastern Africa have relied heavily on existing information from museum collections to obtain baseline information on the distribution and possible vulnerability of crab species (IUCN, 2004). The validity of this method is only as good as the locality data available, which often consist of the original collection label only.

These data are sometimes difficult to interpret, especially in the light of present-day naming systems. A recent literature review that we carried out in an attempt to locate and evaluate populations of crabs in the family Deckeniidae Ortmann, 1897, revealed a number of inconsistencies and uncertainties concerning the recorded locality data of museum specimens. The Deckeniidae form one of the three families of freshwater crabs found in East Africa. The two species that this family comprises, *Deckenia imitatrix* Hilgendorf, 1868 and *Deckenia mitis* Hilgendorf, 1898 are characterized by a radical modification of their mouthparts that sets the deckeniids apart from the other species of East African crabs that belong to the Potamonautidae and the Platythelphusidae (cf. Ng et al., 1995). The Deckeniidae are also phylogenetically distinct from all other African freshwater crabs, making them extremely important in evolutionary and biogeographic studies of freshwater crab relationships (S.R. Daniels et al., unpubl. data). The fact that one of the two deckeniid species is currently listed as vulnerable (VU B1ab(i); C2a(i), ver3.1, 2001) on the IUCN Red List of Threatened Species (Cumberlidge, 2004), and that

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there are indications of a rapid decline in the habitat quality of these ecologically important species (S. A. E. Marijnissen & M. Kamermans, unpubl. data), underline the need for a critical reassessment.

Because incorrect understanding of label information can have far-reaching consequences for the interpretation of distribution patterns, a reinvestigation of the collection localities of deckeniid crabs seemed essential. We here present notes on the reported finding localities of deckeniid crabs from museum collections, based on a meticulous examination of information from literature and available museum material. In addition, we provide a number of new localities based on recent field observations made by the first author.

The genus *Deckenia* was established in 1868 for a new species, *Deckenia imitatrix*, collected by the German explorer Baron C. C. Von der Decken during one of his expeditions to East Africa (Hilgendorf, 1868, 1869). Several authors (Bott, 1955; Ng et al., 1995; Cumberlidge, 1998) have cited Kudiano, Zanzibar as the type locality of *D. imitatrix*. However, we consider this to be doubtful. The type material collected by Von der Decken is now part of the collection of the Humboldt Museum in Berlin, where the original label was replaced with labels that state “Zanzibar” as the collection locality (C. O. Coleman, pers. comm.). It is likely that the original label was lost when the collections were badly damaged during World War II, and that the replacement labels for the deckeniid specimens were based on notes provided by A. Milne-Edwards & Bouvier (1893), stating that the crabs were collected in Kudiano on Zanzibar. However, a locality with the name Kudiano cannot be traced on any maps from that period (e.g., Stieler, 1891; Anonymous, 1906; Ambrosius, 1914), and is not known as a local name on Zanzibar. Furthermore, a recent attempt by the first author to collect topotype material of *D. imitatrix* from the island produced no deckeniids of any kind, in spite of extensive survey work that included a variety of different habitats and localities.

The uncertainty surrounding the type locality of *D. imitatrix* probably arises from a misinterpretation of the original description of Von der Decken’s collection, which included specimens from expeditions to Zanzibar as well as to the East African mainland (Hilgendorf, 1869). The new species that Hilgendorf described were part of a collection from Von der Decken’s journey to the interior of Kenya (see Hilgendorf, 1869: 77; and Kersten, 1869). The seven crabs were accompanied by a single label that stated: “Süßwasserkrabbe aus der Wildniss beim Kudiano” (Hilgendorf, 1869: 78). During that same trip, two specimens identified by Hilgendorf (1869: 77) as *Thelphusa depressa* Krauss, 1843, were also collected. This is most likely a misidentification, because *Potamonautes depressus* (Krauss, 1843) is found only in South Africa (Gouws & Stewart, 2001; compare Bott, 1955). However, there are species of freshwater crab from Kenya that are superficially similar to *P. depressus*, such as *P. johnstoni* (Miers, 1855), which

occurs in the Kilimanjaro region. Hilgendorf (1898) stated that *Deckenia imitatrix* had only been collected from Taru, Kenya, and from north of the border between Kenya and Tanzania. Between 1861 and 1862, Baron Von der Decken undertook an expedition to Mount Kilimanjaro, which departed from Mombasa across the Taru steppe, and passing Kadiaro, a mountain just north of the Kenyan-Tanzanian border (Kersten, 1869). According to Von der Decken's personal notes, on the 3rd of July 1861 the party passed several "round waterholes between one and three foot deep, so called 'Ngurunga's': after which the place was named Ngurungani". In these waterholes, Von der Decken found "many frogs, small brown crabs and a kind of leech" (Kersten, 1869: 238). This is the only note that Von der Decken made about finding crabs on his way to the Kilimanjaro. Ngurungani is situated approximately halfway between Mombasa and Kadiaro. Furthermore, Chace (1942: 226) also listed the type locality of *D. imitatrix* as "Kudiano, Kenya Colony". For these reasons, we consider it likely that the true type locality for *D. imitatrix* is most probably Kadiaro, Kenya instead of Zanzibar, Tanzania.

The second species of *Deckenia* (*D. mitis*) is found in Tanzania and in south-eastern Kenya. The type specimen of *D. mitis* Hilgendorf, 1898 was collected by the German, Stuhlmann on the Wembere steppe in central Tanzania (Hilgendorf, 1898). *Deckenia mitis* has also been reported to occur in southeastern Tanzania in the region of Lake Malawi by Ng et al. (1995), who examined a specimen (ZMB 15425) in the collections of the Humboldt Museum of Zoology in Berlin. Although information on the exact locality where this specimen was found is lacking, it was collected by the German Botanist Goetze (C. O. Coleman, pers. comm.), who joined an expedition to the Tanzanian side of Lake Malawi and the Kinga Mountains between 1897 and 1900 (Engler, 1899, 1902). During that expedition, collections were also made in stagnant pools and wells in southern Tanzania near Lake Malawi (Engler, 1902; R. Jahn, pers. comm.). It is likely that *D. mitis* was collected from one of these wetland localities adjacent to the lake rather than in Lake Malawi itself, given the apparent preferences of the species to burrow in swamps, stagnant pools, and sluggish streams (Ng et al., 1995; S. A. E. Marijnissen, unpubl. data).

The complete list of known localities for *D. imitatrix* and *D. mitis* based on museum collections and recent field observations is provided in table I. Evidently, the distribution of the Deckeniidae covers a restricted region on the East African mainland. The northernmost report of deckeniid crabs is from Eil in Somalia, and the southern limit of their distribution is in southwest Tanzania. *Deckenia imitatrix* is distributed mainly in the lowland coastal plains between Somalia and Kenya. *Deckenia mitis* is found only in a few localities in southeast Kenya, but is widely distributed in Tanzania, where it is found in the coastal lowlands in the east, to the Wembere Steppe in the west, to the southern region near Lake Malawi.

TABLE I

Collection localities for *Deckenia imitatrix* Hilgendorf, 1868 and *Deckenia mitis* Hilgendorf, 1898, and most recent data when the crabs were observed at these localities

Species	Site	GPS coordinates*		Date	Reference	
<i>D. imitatrix</i>						
Somalia	Eil ¹	7°58'N	49°49'E	1980	G. Innocenti (pers. comm.)	
	Ogarca ²	4°13'N	42°40'E	1924	Colosi (1925)	
	Bur Akaba mountain	2°46'N	44°40'E	1971	G. Innocenti (pers. comm.)	
	Giohar ³	2°46'N	45°30'E	1968	NHMW 3469	
	Dinsor ¹	2°23'N	42°58'E	1978	G. Innocenti (pers. comm.)	
	Gavani ¹	2°23'N	42°58'E	1968	G. Innocenti (pers. comm.)	
	Misciani river	1°43'N	44°52'E	1984	G. Innocenti (pers. comm.)	
	Afmadù ¹	0°31'N	42°40'E	1970	G. Innocenti (pers. comm.)	
	Gelib	0°29'N	42°46'E	1970	Parisi (1925)	
	Giuba river	—	—	1986	G. Innocenti (pers. comm.)	
	Giuba	0°14'N	42°38'E	1918	Colosi (1918)	
	Chisimaio	0°22'S	42°31'E	1972	Colosi (1918)	
	Ola Uager	1°13'S	41°31'E	1970	Colosi (1918)	
	Uebi Scebeli river ⁴	—	—	1922	Parisi (1925)	
	Kenya	Nairobi	1°16'S	36°49'E	1910	NHML 1910.12.16.20
		Malindi	1°25'S	40°70'E	1972	J. Olesen (pers. comm.)
		Ijara	1°36'S	40°31'E	1952	NHML ir.9.1-2
Pokomonie ⁵		2°23'S	40°27'E	1896	ZMB 20149	
Arabuko-Sokoke		3°15'S	39°58'E	2004	S. Ashe (pers. obs.)	
Mida creek		3°19'S	39°58'E	2000	S. Cannicci (pers. obs.)	
Kadiaro ⁶		3°40'S	38°40'E	1868	ZMB 3215, 3216, 3287	
Taru ⁷		3°41'S	39°—'E	1868	ZMB 9441	
Samburu		3°46'S	39°16'E	1912	Bouvier (1921)	
Lali Hills ⁸		3°—'S	39°20'E	1967	RMNH D. 26010	
East Africa	Yatta Plateau ⁹	—	—	1911	NHML 1912.5.28.1-3	
	Kavisconda ¹⁰	—	—	1896	NHML 1896.7.19.2	
	Unknown ¹¹	—	—	1947	NHML VIII.10.1	
<i>D. mitis</i>						
Kenya	Murang'a	0°47'S	37°08'E	—	Cumberlidge (2004)	
	Comarock, Athi plains	1°20'S	37°50'E	1906	Rathbun (1921)	
	Tiwi	4°13'S	39°34'E	1912	Bouvier (1921)	
	Mombasa	4°20'S	39°40'E	1904	ZMB 5017, 12492, 15703; MNHN 298	
Tanzania	Gazi	4°25'S	39°30'E	1998	G. Innocenti (pers. comm.)	
	Bariri, Grumeti river	2°03'S	33°52'E	1985	RMNH D. 41858	
	Mount Meru	3°25'S	36°75'E	1964	Williams et al. (1964)	
	Gonja, Same District ¹²	4°16'S	38°20'E	1955	NHML 1955.12.5.4	
	Mhawala ¹³	5°—'S	32°—'E	1892	NHMW 2865	
	Tabora ¹⁴	5°01'S	32°47'E	1934	RMNH D. 14970	
	Wembere Steppe ¹⁵	5°02'S	32°50'E	1892	ZMB 9444	
	Tanga	5°04'S	39°06'E	2004	pers. obs.	
Amani	5°05'S	38°37'E	1994	Harrison (1995)		

TABLE I
(Continued)

Species	Site	GPS coordinates*	Date	Reference
	Bagamoyo, Ruvu river	5°12'S 38°37'E	1933	Rathbun (1933)
	Segera	5°18'S 38°39'E	2004	pers. obs.
	Kilimatinde ¹⁶	5°52'S 34°55'E	1911	ZMB 13505
	Zaranninge Forest	6°02'S 38°00'E	1990's	K. Howell (pers. comm.)
	Dar es Salaam	6°47'S 39°16'E	—	ZMB 9445
East Africa	Ukambani ¹⁷	—	1903	NHML 2866
	Lake Malawi ¹⁸	—	—	ZMB 15425

*GPS coordinates provided are approximations. ¹Specimens collected by B. Lanza for the Instituto di Zoologia of the University of Florence. ²According to Colosi (1925) the finding locality of these specimens was close to the saltmine of Aggherrar. Because Ogarca cannot be traced on any recent maps, GPS coordinates provided here are those of Aggherrar. ³GPS coordinates from Pretzmann (1977). ⁴Parisi (1925) did not provide an exact locality, but stated that a single specimen was collected at the lower Uebi. The Uebi Scebeli (also known as Wabi Shabale or Shebeelle) river runs from the Ethiopian border to the Somali coast near Mogadishu and parallels the coastline as swamps and dry reaches until it is finally lost near Jilib, not far from the Giuba river. ⁵Ng et al. (1995) listed Pokomonie, Witu-land as the site this specimen was collected. GPS coordinates provided here are from Witu. ⁶Type specimen. Hilgendorf (1869) cited Kudiano, which is assumed to be a misspelling of Kadiaro (see text). ⁷Hilgendorf (1898) referred to Taro as the locality where these specimens were collected. This locality is currently known as Taru (e.g., Meyer, 1906; Ambrosius, 1914). ⁸Collected north of the Galana river. ⁹Three specimens preserved by R. L. Scott. Exact locality is not provided. According to the label the crabs were collected on the Yata Plains (= Yatta Plateau). This plateau stretches 300 km along the Athi river in Kenya's Eastern Province. ¹⁰This locality cannot be traced on any maps (e.g., Stieler, 1891; Anonymous, 1906; Ambrosius, 1914). ¹¹A single specimen collected by L. S. B. Leakey. Specific data are lacking. ¹²This specimen was collected by Dr. Gillies from the East African Malaria Unit. The original label states "Gonja, South Pame Dist., Tanzania". However, Pame is not an existing location. Gonja is situated in the Same district. ¹³According to the notes provided, this specimen was collected between Tabora and Muhalala (see also Cumberlidge, 1997), which is probably a corruption of Mhawala, the river that runs southward from the Wembere Steppe, east from Tabora. ¹⁴This specimen, collected by M. Lans, was described as *D. imitatrix*. A re-examination of this ovigerous female by S. Lange and S. Marijnissen revealed that it agrees more with *D. mitis* in most key aspects (see Ng et al., 1995, table 1). It should be noted that the infraorbital margin of this specimen is lined with small and low spines, which is a character state that is intermediate to those normally expressed by *D. imitatrix* (very sharp spines) and *D. mitis* (low granules). ¹⁵Type specimen. Collected on the Wembere Steppe, near Tabora. ¹⁶No exact date provided, however, the specimen was collected during the Kilimantinde-Turu Expedition, which took place in 1911 (Obst, 1911). ¹⁷The location of this swamp is uncertain. A locality with the name Ukambasin (Ng et al., 1995; Cumberlidge, 1997) does not exist on current maps and cannot be found on old maps (e.g., Stieler, 1891; Anonymous, 1906; Ambrosius, 1914). Examination of the old label reveals that the locality is more likely to be Ukambani, which is a region in south-east Kenya. The label furthermore states that the crabs were collected by F. Thomas, in a swamp 4000 feet (1219 m) above sea level (P. Dworschak, pers. comm.). ¹⁸Exact locality is unknown, and it is unlikely that *D. mitis* was collected in Lake Malawi itself (see text).

MNHN = Muséum National d'Histoire Naturelle, Paris; NHML = The Natural History Museum, London; NHMW = National Naturhistorisch Museum Vienna; RMNH = Naturalis National Museum of Natural History, Leiden; ZMB = Humboldt Museum of Zoology, Berlin.

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