

SPIDERS IN AFRICA

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Summary

There are 7935 species, 1116 genera, and 79 families of spiders recorded from Africa. This means that more than 72% of the known spider families of the world are represented in the continent, while only 19% of the described spider species are

recorded from Africa. About 79% of the African spiders are sub-Saharan. There are many new and unexpected species of spiders in Africa waiting to be discovered and studied. It is interesting that both the largest web-spinning species known and the largest orb web ever known are from Africa. Since the earliest name for spiders in Africa, in the Coptic language, a variety of languages appeared and each of them has a word for the spider and sometimes another word for the spider web. Spiders also play a role in African folklore. Sometimes, scientific names of spider taxa are derived from African names. Spiders live in almost all habitats, ranging from dense tropical forests to deserts and including agricultural areas, arid zones, mountains or even in water or at shores. There are many aspects of the behavior of spiders. The predatory behavior of five families are presented. The mating habits of genus *Tidarren* are presented as a specialty of Africa. There are many enemies of spiders. Two different cases of pompilid wasps studied in Africa are presented too. Two categories of venomous spiders are represented in Africa. A study on sociality of a kind of spiders and its role in biological control is presented as an African study. The development of spider studies in Africa was briefly reviewed. The study of spiders in Africa is still incomplete. A complete survey of different African countries is required, taxonomical studies of species, study of life cycles, behavior, and ecological aspects of different species. It may be possible after that to have a good database of spiders in Africa.

1. Introduction

Spiders are fascinating animals that appeared on the earth during the carboniferous geological era, about 300 million years ago. They live in different habitats, in arid regions and wetlands, in lowlands and mountains, in cold tundra and in hot equatorial regions. Spiders are all predators. Their preys range from microscopic mites to vertebrates the size of small birds. They are mostly terrestrial but include one aquatic species and a few inhabitants of tidal zones, in addition to several species that visit water to hunt.

There are about forty two thousand described species of spiders distributed all over the world. Some parts of the world, particularly Europe and North America, are well studied while other regions are poorly known. This chapter provides an introduction to African spiders and their role in the life of the inhabitants of the continent.

1.1. Africa, the Continent of the Largest Web Spinning Spider Known

Nephila komaci Kuntner & Coddington, 2009 of the family Nephilidae has been recently described from South Africa (Maputaland), Tanzania (Zanzibar), and Madagascar. *Nephila* species are renowned for being the largest web-spinning spiders, making the largest orb webs, and are model organisms for the study of extreme sexual size dimorphism and sexual biology. *N. komaci* is the largest web spinning species known. *Nephila* females increased in size almost monotonically to establish a mostly African clade of true giants. In contrast, *Nephila* male size is effectively decoupled and hovers around values roughly one fifth of female size. Although *N. komaci* females are the largest *Nephila* yet discovered, the males are also large and thus their sexual size dimorphism is not exceptional (Kuntner & Coddington, 2009).

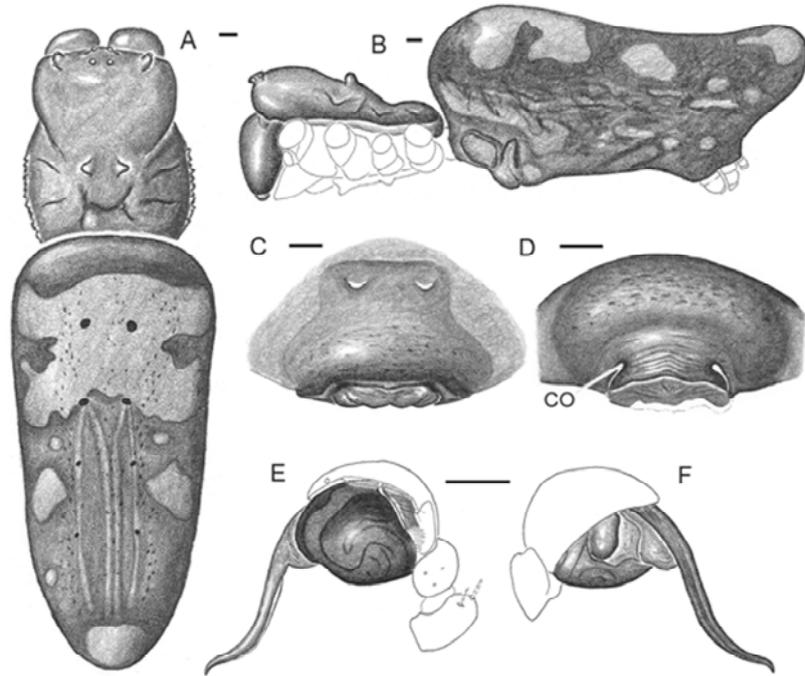


Figure 1. Largest spider in the world: *Nephila komaci* Kuntner & Coddington, 2009
A–D, Female paratype (from Sodwana Bay, South Africa). A, habitus (legs omitted), dorsal. B, same, lateral. C–D, external epigynal morphology. C, ventral. D, posterior. E–F, male palp (from Zanzibar). E, ectal. F, mesal. Scale bars A–B = 1.0 mm, C–F = 0.5 mm. CO = copulatory opening.

Source: Kuntner M, Coddington JA (2009) Discovery of the Largest Orbweaving Spider Species: The Evolution of Gigantism in *Nephila*. PLoS ONE 4(10): e7516. doi:10.1371/journal.pone.0007516.g002

This image was also found in: http://en.wikipedia.org/wiki/File:Nephila_komaci.png



Figure 2. Largest spider's web in the world: A photograph of the web of Darwin's bark spider (*Caerostris darwini*).

Source:

<http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0011234>
 Lalueza-Fox, C.; Agnarsson, I.; Kuntner, M.; Blackledge, T. A. (2010). "Bioprospecting Finds the Toughest Biological Material: Extraordinary Silk from a Giant Riverine Orb Spider". PLoS ONE 5: e11234. doi:10.1371/journal.pone.0011234. This image was also found in: http://en.wikipedia.org/wiki/File:Caerostris_darwini_web.png

1.2. Africa, the Continent of the Largest Orb-Web Ever Known

In Madagascar, probably the hot spot of genus *Caerostris* diversity (Family Araneidae), known as bark spiders, at least one species occupies a unique ecological niche: casting its web across streams, rivers and lakes, so that the orb is suspended above water and attached to substrate on each riverbank via bridge-lines up to 25 m in length. The newly described *Caerostris darwini* Kuntner & Agnarsson, 2010 (Darwin's bark spider) builds its web, a regular orb suspended above water, and maintains it with daily reinforcing of bridge-lines and renewal of the orb for many days. Web size ranged from 900-28,000 cm², with the largest measured web of about 2.8 m² being the largest orb ever measured. With anchor lines capable of bridging over 25 m, it also builds the longest webs among all spiders - a unique form of web gigantism (Kuntner & Agnarsson, 2010).

2. Spiders in African Languages and Folklore

The most ancient known name of the spider in Africa is that in the Coptic language. It is strange that there is no reference to spiders on the monuments of the ancient Egyptians or in their papyri during different eras of their long civilization. It has been claimed that the most ancient word for spider is the ancient Greek one, i.e. *arachne* "ἀράχνη", hence the name of the Class Arachnida, which includes spiders, scorpions, and other arachnid orders.

The Coptic name of the spider "*stajoul*" and the spider's web "*halous*" or "*hallous*" were used after the time of the Pharaonic dynasties (Crum 1939). They are possibly older than the Greek name, that has been known since the time of Ovid (43 B.C. – 18 A.D.) who narrated, in his famous book "*Metamorphoses*", the myth of Arachne and her contest with the goddess Athena. That contest was the "birth day" of the spider in Greek mythology. The Coptic name of the spider's web "*hallous*" is still used in Egyptian colloquial Arabic in Upper Egypt.

Today in Egypt, Arabic is the main language. "*A'nkabout*" means spider in Arabic. People are accustomed to use the word "*a'nkabout*" to mean mainly the spider's web. This is similar to the meaning of "*aranea*" in Latin, as spider or spider's web (Lewis, 1891). The most famous folk tale about spider in Egypt is related to the "*hijra*" or migration of Allah's messenger, the prophet Muhammad, from Mecca to Medina. The story recounts that the spider spun and wove a silky web to cover the mouth of the cave where Muhammad and his companion Abu Bakr hid themselves. This story led to the belief that the spider is something "holy" or venerated, and is the reason that some Muslims do not remove spider's web covering their buildings.

2.1. The Names for “Spider” In Africa

The existence of a name for the spider in different African languages means that the people recognize this creature and differentiate between spiders and insects that have other names. Also, some languages have a separate name for spider's web. This means that they view spider's web as separate from the animal that fabricates it.

It is estimated that there are between 2000 and 3000 languages spoken on the African continent, with possibly as many as 8000 dialects. African languages are divided into four major language families, i.e. Afro-Asiatic (in North and East Africa), Nilo-Saharan (median regions among Nile and the Sahara), Niger-Kordofanian (in sub-Saharan West to South Africa) and Khoi-San (in South Africa). In addition, Austronesian languages are spoken in Madagascar (African Languages).

It is beyond the scope of this chapter to review all spider names in different African languages. Only some of them will be compared here, related to African countries where they are spoken. It is essential to the researcher to know the local name for the spider in the country or region of his study.

1. *A'nkabout* means spider in both classical and colloquial Arabic of Egypt, Sudan and other North African countries. It is used for spider's web too. Arabic is a Semitic language of the Afro-Asiatic family.
2. *Teglest*, pl. *Teglas* = is the word for spider in the Siwi language (El-Gohary ?). It is an Eastern Berber language that is not used outside Siwa Oasis in the western desert of Egypt.
3. *Tartelet*, pl. *Tertelen* = spider; *Olli*, pl. *Eolliin* = spider web; While *Takhkhosht* = insect (Amawal) in the Nafusi language. Nafusi is an Eastern Berber language (Tuareg languages) used in Libya and Tunisia. It is closely related to the Siwi language.
4. *Saras*, pl. *isarasen* (m). = spider in the Tuareg language or Tamazight of Algeria (Motylinski, 1908).
5. In the Nubian language, a poisonous spider is called *Kourabe* in Fadiga Meahus dialect and *Korab* in Kenzi – Dungolawi dialect (Simbag ?). The Nubian language is used in both the south of Egypt and north of Sudan. It is an Eastern Sudanic language of the Nilo-Saharan family.
6. *Akarkar* = spider in Dinka language of southern Sudan (Dinka-English Dictionary). It is a member of the Western Nilotic of Nilo-Saharan languages.
7. *Embare* = spider in the Maasai language, the Eastern Nilotic language spoken in southern Kenya and northern Tanzania by the Masai people (Maasai dictionary). It has other forms in different dialects: *e-surusuri*, *ol-pipí* [South], *n-aporsainiá* [Chamus], *ol-kédi*, *e-súrisúri*, *n-apuo ntáre sukuta* [North] (Payne & Ole-Kotikash, 2008).
8. *Shärärit* = spider, *Yäshärärit dr* = cobweb in Amharic (Amharic Dictionary). The Amharic language is spoken in North-central Ethiopia. It is a South Ethiopian language of the South Semitic branch of the Afro-Asiatic language family.
9. *Caaro* = spider in Somali. Somali is an Eastern Cushitic language of the Afro-Asiatic language family. It is spoken in Somalia (national language), Djibouti, Ethiopia, and Kenya (Somali - redsea-online.com).

10. *Hala* = spider, *tranon-kala* = spider web in Malagasy, the Malayo-Polynesian language of the Merina ethnic group of Madagascar (Malagasy - Webster's Online Dictionary).

11. *Buibui* = spider, *utando wa buibui* = spider's web in Swahili (Swahili - English Dictionary). Swahili (or Kiswahili) is a Bantu language of the Niger-Congo language family. It is spoken in several countries from Kenya to northern Mozambique and westwards to Congo (Swahili - English Dictionary).

12. *Tàùtáù* = spider, *jê tàùtáùbè* = spider web in the Kanuri language which is spoken in Nigeria, Niger, Chad and Cameroon. It belongs to the Western Saharan subphylum of Nilo-Saharan.

13. *Gízòò* = spider, *Sáakàr gízòò* = the spider web in Hausa (Hausa Vocabulary). Hausa is a Chadic language spoken in Benin, Burkina Faso, Cameroon, Ghana, Niger, Nigeria, Sudan, and Togo. It belongs to the Afro-Asiatic language group (Hausa-Wikipedia).

14. *Jargoñ* = spider (Diouf, 2003) or *Diargogne* = spider (Angrand, 1952) in Wolof. One of the common sayings is: *Lii nuru na jargoñ*. = This looks like a spider (Peace Corps - Gambia, 1995a). The Wolof language is spoken in West Africa (Senegal, Gambia, and Mauritania). It belongs to the Atlantic branch of the Niger-Congo language family. Wolof dialects may vary between countries (Senegal and the Gambia) and rural and urban areas (Wolof language).

15. *Ananse* = spider, *ananse-ntontam* = cobweb in the Twi (pronounced: chwee) or Akan language which is widely spoken among the people of Ghana (West Africa). Anansi is the trickster spider of Akan folklore (Twi-Akan).

16. *Taalingo* = spider, *Taalinjaloo* = spider web in the Mandinka language (Peace Corps The Gambia, 1995b). It is also called Bambara or Bamanankan. It is spoken in Mali, Burkina Faso, Côte d'Ivoire, Guinea, Senegal, and The Gambia.

17. *Aláòtakùñçlènà* = spider, *Ìtakùnaláòtakùñ* = spider web in Yorùbá (Smith & Onayemi). Yorùbá is spoken in Nigeria, Togo, and Benin. It belongs to the Niger-Congo language family.

18. *Ntànde(a)* = spider, *Bùntànde(a)* = spider web in the Cilubà language, spoken in Congo (Cilubà).

19. *Jètá* (in Asu), *Bòßòl* (in Basaa), *Tàndà* (in Bemba), *ßùßì* (in Bukusu), *Tàáandu* (in Kinyaamwezi) = spider in 5 Bantu languages (Bantu Basic Vocabulary Database). It is a sub-branch of the Niger-Congo language family.

20. *Segokgo* or *segoko* = spider in Sesotho the language of Lesotho and part of South Africa (Sesotho sa Leboa).

21. *Spinnekop* = spider in Afrikaans of South Africa. It is a West Germanic language.

2.2. Spiders in African Folklore

In west Cameroon, the great god is Nyambe. He created the earth; therefore it is thought that he lives inside the earth beside dead people... Some people say that he lives in heaven behind the moon and that he came down to the earth on a spider web carrying man and woman to inhabit the earth.

In Cameroon too, they use a kind of spider to make predictions since they think that it is the first creature on the earth. They clean the area in front of its burrow and they put plant leaves in the area after making a fence of dry stones around it. The man who wishes to ask the spider whispers his question. The spider disturbs the arrangement of

the leaves when it comes out of the burrow. Then the man comes back to "read" the answer of the spider depending on the rearrangement of the leaves (Deschamps, 1960).

In Hausa folk-tales, there are many stories about spiders. Reading the names of these stories gives an idea about the character of the spider in the Hausa culture. "The deceitful spider, The thieving spider, How the spider ate the hyaena-cubs' food, The greedy spider, The spider which bought a dog as a slave, The spider passes on a debt, The spider pays his debts, How the spider outwitted the snake, The jackal's revenge on the spider." Also, while the spider name is *Gizzo*, his wife's name is *Koki*. In the folk-tales *koki* is supposed to be the spider's wife, it is really the praying mantis (Tremearne, 1914). The other names related to spider in Hausa are: Spider = *gizo-gizo*; *tautau*. mythical --, *gizo*; *k'ok'i*. Spider's web, *yana II*; *sak'ar gizo*. *dokon allah*; *k'ok'ik'ok'i* = Mantis (Maguzawa).

Animal tricksters are often small, helpless creatures who manage to outwit bigger and fiercer animals. Anansi, the spider trickster of the Ashanti people, is known throughout West and Central Africa (African-Mythology).

In Fulani proverbs in western and central Africa, we find: "The spider that knows what it will gain sits waiting patiently in its web. The praying mantis is never tired of waiting all day." (Fulani).

Spiders and spider webs may be used in some kinds of traditional medicine, especially for healing wounds. The following prescription is from Siwa Oasis (Egypt): "Healing wounds prescription: a dry mixture of spider's web and palm dates is ground. Its powder is applied on the wound with "kohl" in addition to sugar or salt" (El-Gohary ?).

2.3. Scientific Names of Spider Taxa Derived From African Languages

The genus *Anansia* Lehtinen, 1981 includes only one species of the Family Tetrablemmidae from Angola. Its name is the name for spider in Ashanti language. Huber (2007) used the same Ashanti name to name his new genus, of Family Pholcidae, *Anansus* that includes three species from Congo, Ghana, and Ivory Coast in West Africa.

"*Buibui*", the name of the spider in Swahili language, was used as a genus name to include five new species of the Family Cyatholipidae from Bioko, Cameroon, Congo, Ethiopia, and Kenya (Griswold 2001). This genus is endemic to Africa. The same Swahili name was used in forming a new genus name *Buitinga* of the Family Pholcidae. The name was derived from the Swahili for 'large spider' (*bui*) and 'vibrate' (*tinga*). It refers to the vibrating and whirling movements that many long-legged pholcids make when disturbed (Huber 2003). The genus included 17 new species in addition to 3 species transferred from other genera. This genus is endemic to Africa too. All of its species are distributed in Congo, Kenya, Malawi, Tanzania, and Uganda.

"*Hàla*", the Malagasy name of the spider, was chosen to be the name of a new genus by Jocqué (1994). This genus of the Family Pisauridae included two new species that are endemic to Madagascar.

"*Abu Shabat*" is a vernacular name of the hairy spider in Egypt. The first Egyptian araneologist, Prof. A. I. Hassan, described a new tarantula species of Family Theraphosidae from Egypt (1950) and named it *Chaetopelma shabati*.

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Biographical Sketch

H. K. El-Hennawy received the B.Sc. (Zoology-Chemistry) from Ain Shams University in 1976, the Diploma of Police sciences from Police Academy of Egypt in 1978, and the Diploma of Medical Entomology from El-Zagazig University in 1986. He was the director of Department of Documents' Examination, Criminal Investigation Authority of Egypt, 1978-2000. He is the founder and curator of the Arachnid Collection of Egypt, since 2004. He is the founder and editor of "*SERKET*" the Arachnological Bulletin of the Middle East and North Africa, since 1987. He is a member of the: International Society of Arachnology (ISA) since 1979 [Correspondant and member of the International Committee], British Arachnological Society, Australasian Arachnological Society, Egyptian Entomological Society, Zoological Society of Egypt, Spider Club of Southern Africa, American Arachnological Society, Groupe d'Etude des Arachnides, European Society of Arachnology (ESA), Egyptian Society of Natural Toxins, etc. He was a participant of many scientific seminars and conferences since 1982 and 7 international congresses of both the ISA and ESA since 1983. He participated in: Program of studying the natural resources in the protectorates of Southern Sinai, (EEAA), 1994-1995; MedWetCoast Project for the Conservation of Wetland and Coastal Ecosystems in the Mediterranean Region, UNDP, 2000-2001; UNESCO Committee of studying Egypt's northern Oases (2002-2003), which yielded the inscription of the "Whales' Valley" on the World Natural Heritage List in August 2005. He was a member of the National Committee of Biological Sciences, Academy of Scientific Research and Technology of Egypt, 2004-2009. He has more than 80 published papers since 1985, mainly on spiders and other arachnids. His books are: Glossary of Biological Terminology (1990), The Egyptian Arachnids (2002), and a few books

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SAMPLE CHAPTERS