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Taxonomic Results of the BRYOTROP-Expedition to Zaire and Rwanda

2. History of Bryological Exploration of Zaire and Rwanda

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Abstract. A short survey of the bryological exploration of Rwanda and Zaire is provided. The first to collect bryophytes in the area was Stuhlmann in 1891 on Ruwenzori. The first bryological collections from Rwanda were made by Mildbraed in 1907. In 1929 Humbert made the first gatherings on Mt. Kahuzi and Mt. Biega. Since then a lot of botanist have collected mosses and liverworts so that Rwanda and eastern Zaire can be regarded as well known. From most parts of Zaire and from Burundi however only few data are hitherto available.

It was only 100 years before the BRYOTROP-Expedition to Zaïre and Rwanda that bryophytes were collected for the first time from Central Africa. The History of this first expedition, which is connected to the names of Emin Pascha and Franz Stuhlmann is so remarkable, that it should be shortly repeated here. The german surgeon Dr. Eduard Schnitzer alias Emin Pascha (1840 - 1892) became governor of the Equatoria Province in the Egyptian Southern Sudan in 1878. Because of the Mahdi-revolt, which lead to the fall of Khartoum in 1885, all traffic connections to Equatoria were interrupted and Egypt gave up this province. Emin Pascha however stayed for several further years until Stanley met him during a relief expedition in 1889 and they travelled together to the German Territories in East Africa. They reached Bagamoyo on the 4. December 1889. At that time, the German Colonial Government tried to explore and secure the almost unknown interior of their colony. Reichskommissar von Wissmann planned a research expedition with political and military aims under the leadership of Emin Pascha. Emin emphasized the importance of an accompanying naturalist and choosed the young zoologist Dr. Franz Stuhlmann (1863 - 1928) (Fig.1) (see Bindseil 1990). The expedition had order to save all territories south of Lake Victoria-Nyanza as well as between Victoria-Nyanza and Tanganyika up to Albert-Nyanza for Germany and to prevent British influence in this area. The expedition started the 26th april 1890, accompanied by 150 Askari and 400 porters. They marched to Mpapua, the westernmost military station at that time in German East Africa and to Tabora where the

Arabs accepted the German government. In November 1890 they reached the western shore of Lake Victoria where they founded the station Bukoba. When they arrived in Karagwe in march 1891 it would have been the most easy way to go south-westward to explore Rwanda as it was planned by von Wissmann. However Emin Pascha decided, ignoring von Wissmanns orders to march northward to reach Lake Albert and the Southern Sudan.

In spite of rain, hunger and several diseases, Franz Stuhlmann collected a large amount of scientific material, including several bryophytes from the Ruwenzori Mountains, which he explored from the western side (e.g. *Lepidozia stuhlmannii*, *Breutelia stuhlmannii*). In September 1891 the expedition decided to return to the East African coast. Franz Stuhlmann continued with 27 Askari and 100 porters to Bukoba, while Emin Pascha stayed with the sick in order to follow Stuhlmann later. However he went westward to the river Congo where he was killed by arabs on the 20th October 1892. Stuhlmann, now leader of the expedition, reached Bagamoyo on the 12th July 1892 and arrived in Europe on the 20th October 1892. He had collected valuable botanical and zoological material, as well as ethnographic and geographic data, which were published two years later (Stuhlmann 1894). These collections were the beginning of bryological exploration in Central Africa.

From 1893 to 1908, several botanists collected bryophytes in Zaïre, the former Belgian Congo. Scott-Elliot worked in the Ruwenzori-Mountains from 1893 to 1894 and the results were published in 1896. The collections of Dewevre (1895 - 1896) were determined by De Wildeman & Durand (1901). From 1903 to 1904 E. & M. Laurent collected in Western and Northern Zaire (Ubangi, Kasai) and their results were published by Cardot (1908, 1909). Meanwhile several bryological papers, dealing mainly with mosses had appeared (Renauld & Cardot 1896, 1899, 1902). Another important contribution was made by Vanderyst, who, among thousands of phanerogams collected bryophytes as well.

Until 1907, Rwanda was almost unknown concerning its flora and fauna. During the expedition of Graf von Goetzen (1894) apparently no bryophytes were collected. Richard Kandt (1914, see Bindseil 1988) who lived in Rwanda as private naturalist and later as the Imperial resident for Rwanda made some botanical collections, unfortunately only phanerogams.

In 1907 Adolf-Friedrich Herzog zu Mecklenburg started an expedition, which mainly intended to explore Rwanda and the eastern Belgian Congo. He was accompanied by Egon Kirschstein, geologist, Johannes Mildbraed, botanist (Fig. 2), Hermann Schubotz, zoologist, Jan Czekanowski, anthropologist, Max Weiß, Lieutenant and cartograph, W. von Raven, physician and bacteriologist as well as Lieutenant Walter von Wiese und Kaiserwaldau, Friedrich Weidemann, Sergeant Czeczatka and 25 Askari (Mecklenburg 1909). They went by train to Lake Victoria, marched to the northeast of Rwanda, where they collected at the Lake Mohasi (see Bamps 1975). After having visited the court of King Yuhi V. Musinga, Mildbraed and Schubotz left the expedition for about two weeks in order to collect plants and animals in the Nyungwe forest (= Rugege Wald). Until March 1908, Mildbraed visited Lake Kivu and the Virunga Volcanoes, afterwards the eastern Congo (Ituri, Aruwimi) and the Ruwenzori. In May 1908 the expedition went down the river Congo with a steam boat until they reached the western coast. They arrived at Hamburg on the 30th June 1908. The scientific results were published until 1925. The botanical volume, edited by Mildbraed (1914) covered 718 pages. The hepatics were studied by Stephani (1914), who recognized 57 species, among them 45 new species of liverworts and one new hornwort. The genus *Sphagnum* was studied by Warnstorf (1914) covering 5 species of which 3 were described as new. The mosses finally were identified by Brotherus (1914), who described 57 new species from the 137 species recognized. Their treatment should remain a classic work and the only bryological account of Rwanda and Zaïre for more than 30 years. It also was the base for Demaret's check-lists of Central Africa (see below).

From 1908 to 1909 the Duke of the Abruzzes explored the Ruwenzori Mountains and the bryological results were published by Gola (1909, Hepaticae) and Negri (1909, Musci). Among other species they discovered *Chandonanthus cavallii* Gola and *Tortula cavallii* Negri.

Fig. 1. Franz Stuhlmann (1863 - 1928) (after Stuhlmann 1894)

Fig. 2. Johannes Mildbraed (1879 - 1954) (after Mecklenburg 1909)

In 1914 J. Bequaert again collected on the Ruwenzori and Naveau (1928) described a new *Sphagnum* from his material. From 1926 to 1927 D.H. Linder of the Harvard Institute of Tropical Biology collected on the Virunga Volcanoes. The bryophytes were published by Theriot (1930). The French botanist Humbert was the first to collect on Mt. Kahuzi and Mt. Biega in 1929. He also visited the Virunga Volcanoes. His name is commemorated in the genus *Bryohumbertia* (Dicranaceae).

Lucien Hauman worked on Ruwenzori in 1932 and published some bryological results in 1942. Several new species from his collections were described by Herzog (1936).

From 1933 to 1935 the Belgian zoologist De Witte collected in the Albert National Parc (today Parc National Virunga in Zaïre and Parc National des Volcans in Rwanda) and so did the botanist Lebrun from 1937 to 1938. Based on these gatherings, a flora of the mosses from Albert National Parc was published by Demaret & Leroy (1944). Two years before, the first check-list of Central African Mosses was published by Demaret (1940), followed by list of Hepatics (Demaret 1942). This first account of the bryophytes from Zaïre, Rwanda and Burundi presented a compilation of all data hitherto available.

After the Second World War botanical exploration was intensified. Demaret worked in the Ruwenzori from 1953 to 1957 and Jean-Jacques Symoens collected in Rwanda and Zaïre from 1955 to 1958. He visited Nyungwe Forest as well as Tshibati and Lwiro, today part of the Kahuzi National Parc. His hepaticological results were published by Vanden Berghen (1960, 1961, 1965). After the independance of Rwanda and Zaïre, only a few bryologists continued to work in this phytogeographically interesting region. In 1971 and 1974, J.L. De Sloover collected in the Nyungwe Forest and on Mt. Karisimbi in Rwanda. He also made extensive collections on Mt. Kahuzi, Mt. Biega and around the station Irangi. The Hepaticae were published by Vanden Berghen (1977) and the mosses by De Sloover (1973, 1975 a-d, 1976 a&b, 1977 a&b, 1979, 1982, 1983, 1986, 1987) in the course of some revisions for the whole African continent. Some other botanists, who mainly collected phanerogams, made bryophyte gatherings as well (e.g. Bouxin, Lisowski, Malaisse, Petit etc.). During botanical exploration for the "Flore du Rwanda, Spermatophytes", Troupin collected also bryophytes. From 1984 to 1992 the author studied the bryophytes of Rwanda and Eastern Zaïre and was the first to collect in remote sites (Cyamudongo Forest, Busaga Forest, Kagitumba, Ibanda Makera etc.) and bryologically undercollected regions.

In 1991 the BRYOTROP-Expedition investigated the bryophytes along an altitudinal gradient from 850 to 4500 m in the Kahuzi-Biega National Park, the Nyungwe forest and Mt. Karisimbi. While the bryoflora of Rwanda is now fairly well known and a Flora of the Hepaticae and Anthocerotae is in preparation (Fischer in prep.), most parts of Zaïre and Burundi are still in need of collection. Except for Shaba (Vanden Berghen 1972 b, 1978 b), the region west of Lake Kivu and the Ruwenzori, only a few specimens are known from such interesting and isolated areas like Itombwe Mountains, Masisi and Upemba. The situation of Burundi is comparable and only Lewalle and Petit made extensive collections, most of the specimens not yet identified. Thus only few recent studies are available (Vanden Berghen 1972a, Petit & Symons 1974). However, compared with our knowledge on other African countries, Burundi belongs to the few with more than 10 records of Hepatics per square kilometer (Pócs 1982).

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