

S. ROBBERT GRADSTEIN

Stephani's Species Hepaticarum revisited

Abstract

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A brief account of the life of Franz Stephani, 1898-1925, together with an assessment of the scientific significance of his major publication, Species Hepaticarum, a worldwide treatment of the species of *Hepaticae* and *Anthocerotae*, are presented.

Key words: Franz Stephani, biography, history of botany, bryology, *Hepaticae*.

“Der Unterzeichnete hat sich die Aufgabe gestellt, die gesamten bisher bekannten *Hepaticae* in der Form von einzelnen Aufsätzen successive in diesen Heften zu beschreiben.” Thus begins the introduction of Species Hepaticarum, a 6-volume treatment of the species of *Hepaticae* and *Anthocerotae* of the world by the German bryologist Franz Stephani (Fig. 1). Published between 1898 and 1925, Species Hepaticarum was the first and last treatment of its kind since the appearance of Synopsis Hepaticarum (Gottsche & al. 1844-1847). These two works could hardly be more different. While Synopsis Hepaticarum was a grand synthesis of hepaticological knowledge at its time, written by three leading authorities in the field, Stephani's work is of far less quality and holds the reputation of being one of the most notorious publications in bryology. According to Schuster (1966) the work came as a “lasting shock” and created “a severe trauma from which hepaticology will not recover for many years.” Verdoorn (1934) called it an “Opus excludendum.” A century after its appearance, taxonomists are still busy clearing the mess. Who was this man, Stephani, who turned hepaticology upside down?

Franz Stephani was born in Berlin on 14 April 1842, the son of a well-to-do merchant. He visited the local Königliches Gymnasium from which he graduated in 1859 at the age of 17. Afterwards he worked for several years as a voluntary assistant in a wool spinning-mill at Dessau. During 1863-1866 he travelled to London, Scandinavia, Rotterdam and New York, where he received professional training as a businessman. After his return from New York he held posts in several wool spinning-mills as a merchant and never again left Germany except for family vacations in the Alps. In 1880 he moved to Leipzig where he became the director of a wholesale toy store during four years, then entered the publishing house of Julius Klinkhardt to become a vice-president of this company until his retirement in 1907.

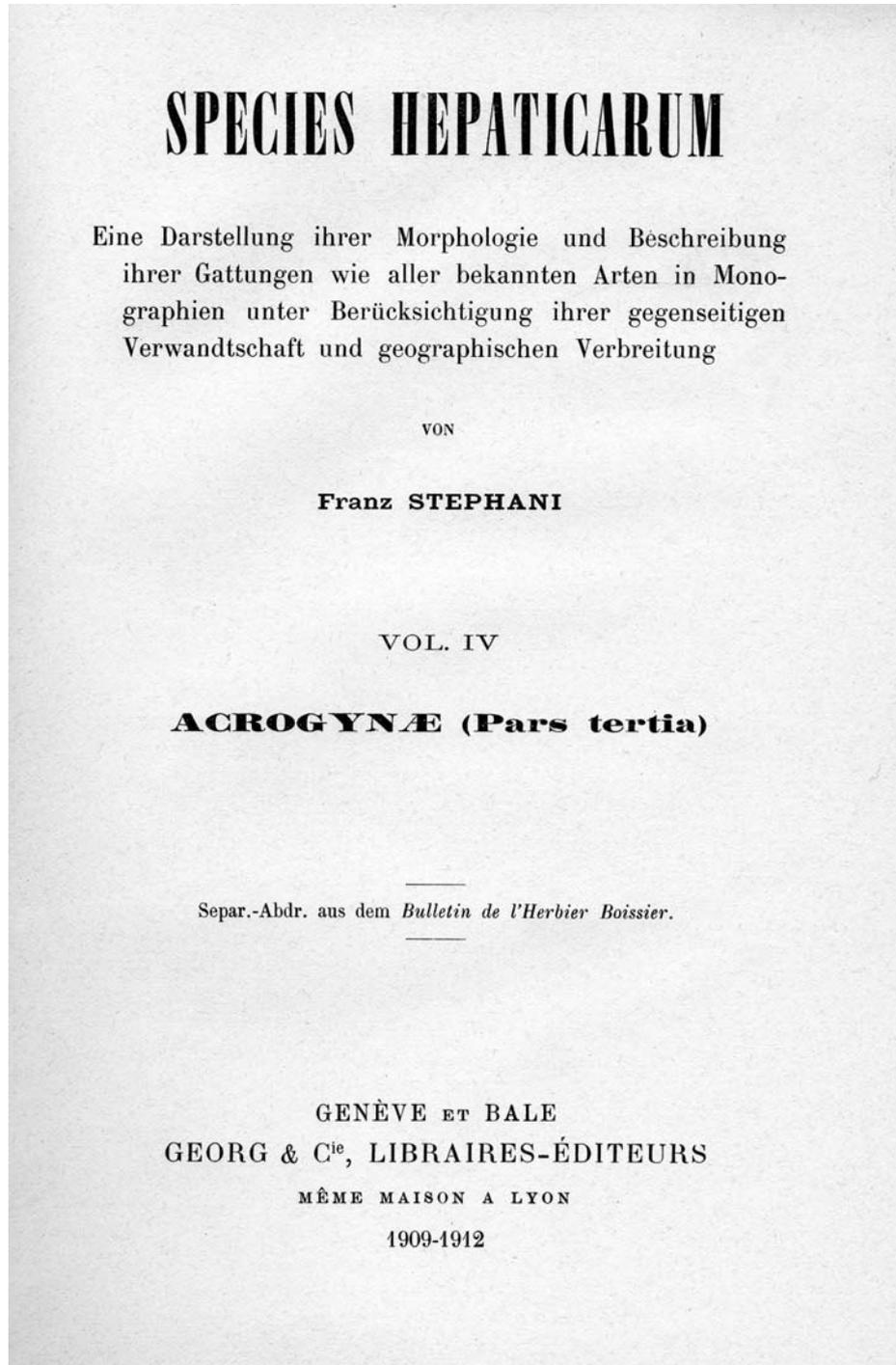


Fig. 1. Titelpage of Species Hepaticarum Vol. 4.

How Stephani became interested in liverworts remains unknown; he never attended university nor did he receive a formal training in botany or bryology. He seems to have been much inspired in his early youth by the writings of Alexander von Humboldt, especially “Kosmos”, and was acquainted with Paul Meyerheim, a well-known animal painter at the time (F. Verdoorn, pers. com.). With Meyerheim, Stephani undertook many field trips, drawing plants and animals, and in 1862, at the age of twenty, he already was in the possession of a herbarium. In 1869 he married Marie Kell, the daughter of Julius Kell, a well-known novelist of that time. They had two children, a son and a daughter. Together with his wife, Stephani went on long summer trips during holidays, especially to the Erzgebirge in Saxony, where he began collecting his first hepatics. His personal herbarium or other herbaria do not contain material gathered on these early trips, however.

In 1876, when he was 34 years old, Stephani published his first paper, on the hepatics of Zschopau in the journal of a local natural history society. His second publication, a concise illustrated flora of the *Jungermanniideae* of Germany, appeared three years later. As explained in the introduction, Stephani wrote the latter work mainly as an aid for himself to become acquainted with liverwort morphology. The work already shows the typical characteristics of his later publications: brief standard descriptions in Latin, very little discussion, and simple, generalized illustrations, which are no match to those of Gottsche or of Schiffner in his early career.

After having moved to Leipzig, Stephani began giving more and more attention to liverworts, building a large herbarium and entering in exchange contacts with other bryologists in Germany and abroad. Soon he was in touch with Jack, Limpricht, Lindberg, Spruce, Mitten, Pearson, Levier, Underwood, Schiffner, Evans, etc. Curators of herbaria, glad to know of someone willing to identify their unnamed material, started sending him collections from all parts of the world. Stephani was an obliging correspondent, endearing himself greatly in the hearts of the herbarium and museum executives, because everything sent to him was returned before long with an identification. Following the death in 1888 of Carl Maria Gottsche, the world’s leading hepaticologist at the time, Stephani soon became a reputed authority in hepaticology and accumulated a liverwort herbarium of worldwide importance. It was by then that Stephani took the unfortunate decision to write his *Species Hepaticarum*, an account of the species of the *Hepaticae* and *Anthocerotae* of the world.

About 1894 Stephani got in touch with M. W. Barbey-Boissier, the son-in-law of Edmond Boissier and owner of the private Boissier herbarium in Chambésy/Geneva. Three years later the Boissier Herbarium signed a major agreement with Stephani, according to which they undertook to publish the planned *Species Hepaticarum*. Stephani, in return, agreed to leave them after his death his herbarium, drawings, library, notes, scientific correspondence, and even his microscope, for 7500 Swiss Francs (Geissler 1982). The first instalments of *Species Hepaticarum* were published in 1898, in the *Bulletin de l’Herbier Boissier*, and the work was concluded twenty seven years later, in 1925.

Upon his retirement from the position at the Klinckhardt publishing house 1907, Stephani was financially quite well to do and from 1910 lived in a spacious villa in Oetzsch near Leipzig. From now on he dedicated himself fulltime to *Species Hepaticarum*. However, the war years of 1914-1918 brought him and his family much trouble, their income diminishing as a result of the inflation. The food situation became very difficult, his wife died, and the family had to move to the attic, renting the other parts of the house. In spite of these difficulties, Stephani continued working frenetically on his liverwort collections, day and night, until 3 or 4 in the morning, usually with a nap in the afternoon. In 1917 Stephani suffered a stroke, which left him in a half paralysed condition. His mental powers became very poor, he was no longer able to recognize his children (Verdoorn 1934), yet continued to describe liverworts. On 23 February 1927, Stephani died peacefully at the age of 85.

Stephani’s publications include about 200 titles (Geissler 1982, Frahm & Eggers 2001). Many of these are identification lists and some were put together by others rather than by himself. *Species Hepaticarum*, covering over 4000 pages, is Stephani’s only major scientific work.

The work appeared in 149 fascicles over a period of 27 years, from 1898 to 1925, and was completed two years before his death. Though very ill during the last ten years of his life, Stephani lived long enough to see the completion of his opus magnum. The first three volumes appeared in instalments in the *Bulletin de l'Herbier Boissier* and were bound with separate pagination. After the journal ceased publication in 1909, the remaining fascicles appeared only in book form, as volumes 4-6. Volume six is a supplement and contains the general index to the whole work. Due to the illness of Stephani, most of the proof-reading of the final volume was handled by Gustave Beauverd, curator of the Boissier Herbarium, who also took care of preparing the index. Portions of the manuscript of volume six, however, did not appear until twenty nine years later (Bonner 1953a, 1953b).

Species Hepaticarum contains descriptions of almost 10 000 species of liverworts and hornworts, including more than 4000 new ones established by Stephani himself. All of them were briefly described in Latin, in a very uniform and concise, rather schematic manner, without keys or discussions and with very little information on geographical distribution. The descriptions are usually little informative, without mention of important diagnostic characters, and often contain errors. The task undertaken was apparently too large and too difficult, and Stephani's taxonomic capabilities too limited for the job. Species are described over and over again under different names, sometimes even based on the same material, and often in the wrong genus. Moreover, species reduced to synonymy in one place are often reinstated in another without reason. Other workers such as William Colenso, Nils Conrad Kindberg and Carl Müller are known for having described numerous erroneous species but with the exception of Müller these bryologists worked on a regional, not world-wide basis. Probably more than eighty five percent of the species described by Stephani as "spec. nov." were superfluous. For example, *Acrolejeunea emergens* (Mitt.) Steph. from Africa was described under eight different names, twice based on the same specimen, and the Asiatic *A. fertilis* (Reinw. & al.) Schiffn. under nine names, in four different genera (Gradstein 1975). The number of species in the genus *Acrolejeunea* thus increased from thirty eight in *Die Natürliche Pflanzenfamilien* (Schiffner 1893) to eighty five in *Species Hepaticarum*. Nowadays, no more than fifteen species are recognized in this genus, the rest being synonyms or belonging to other genera. The situation in *Acrolejeunea* is typical for almost all groups of liverworts. The number of species in *Plagiochila* increased almost fourfold in *Species Hepaticarum*, from 400-500 to nearly 1600 (Schuster 1966). Material of *Plagiochila longiramea* Steph. from one single locality in Bolivia was described five times as new to science under different names, and *P. bifaria* (Sw.) Lindenb. under three names (Heinrichs & Gradstein 1999). Almost two hundred species from Bolivia described by Stephani, including the only neotropical records of *Schistochilaceae* and *Petalophyllum* are still unrevised and probably erroneous (Gradstein & al. 2003). Together, they constitute more than one third of the Bolivian liverwort flora.

Not only taxonomic concepts but also bibliographic and nomenclatural citation in *Species Hepaticarum* is poor and marred with error. The principle of priority was rejected for generic names and citation of synonymy considered undesirable: "Hinsichtlich der Priorität der Gattungsnamen bin ich der Ansicht gefolgt, dass eine Diagnose, welche die Pflanzen erkennen lässt, zweifellos gefördert werden muss; ist die älteste Diagnose schlecht ... so muss die diejenige jüngere Diagnose, welche zuerst die Gattung genügend und rein dargestellt hat, benutzt und deren Name gewählt werden; eine Verbesserung der alten Beschreibung ist nicht zulässig ... Was die Synonyme angeht, so werde ich alte, längst abgethane Namen nicht wieder aufnehmen; ebenso wenig manche auf Grund neuer Anschauung entstandene Namen. Ich will dem dringenden Bedürfnis einer Beschreibung aller bekannten Lebermoose abhelfen und in übersichtlicher und gedrängter Form das Wissenswerthe bieten; hierzu brauche ich nur diejenige Synonyme, welche volle Klarheit schaffen für den Namen der Pflanzen und das Citat; was manche neuere Nomenclatoren, die gar keine Kenntnisse auf dem Gebiete der hier behandelten Pflanzen besitzen noch zu besitzen vorgeben und daher gar nicht im Stande sind, zu beurteilen, ob eine Diagnose für den Fachmann noch annehmbar ist oder nicht, was diese Herren uns an Namen aufdrängen wollen,

kann in vielen Fällen übergangen werden, denn es ist ein nutzloser Ballast” (Stephani 1898: 1-2). It is paradoxical that the laws of priority must nowadays be applied to a work in which this principle was explicitly not accepted. Rejection of the entire Species Hepaticarum by treating the work as an opus excludendum was discussed as early as 1934 but already by that time such action was considered too late as many had begun using Stephani’s names, whether rightly or wrongly (Verdoorn 1934). It is a pity that a rigid reviewing system of scientific publications did not exist in those days: history might have taken another course when it had been in use!

The impact of Species Hepaticarum on liverwort taxonomy has been very large. The number of liverwort species of the world became more than doubled and many more times so for exotic regions. It is now estimated that the number of hepatics worldwide is only half that accepted by Stephani and does not exceed 5000-6000 species (Heinrichs & al. 2005). Due to the vast amount of ill-founded species and errors in Species Hepaticarum, work on exotic liverworts by others came to a standstill for several decades. For example, Victor Félix Schiffner (1862-1944) who had just authored the *Hepaticae* in Engler & Prantl’s *Die Natürliche Pflanzenfamilien* and the first volume of the liverwort flora of Java (Schiffner 1893, 1900), gave up working on exotic liverworts after the first instalments of Species Hepaticarum appeared and turned to the European flora. An unfinished manuscript on the liverworts of Brazil, based on his travels in 1901 in the framework of the “botanischen Expedition der kaiserlichen Akademie der Wissenschaften nach Südbrasilien,” was completed by Sigrid Arnell twenty years after Schiffner’s death (Schiffner & Arnell 1964). The leading American hepaticologist Alexander William Evans (1868-1959) restricted his attention mainly to the North American flora and finally turned to lichenology. Also the talented Dutch hepaticologist Frans Verdoorn (1906-1984), the first to tackle the revision of Species Hepaticarum, gave up (see below).

Recovery of hepaticology in the post-Stephani era has been very slow and much time has gone into sorting out the identity of Stephani’s taxa. The cleaning of this Augean stable has lasted until today and many of Stephani’s species are still awaiting revision. In 1988, Schuster estimated that liverwort monographers still spent over 50 % of their time sorting out Stephani’s legacy. One of the first to engage in this unthankful job was Verdoorn (1934). For his PhD thesis on Asiatic *Lejeuneaceae* he examined about 500 types and at least half of his work was only made necessary by the muddles and duplications in Species Hepaticarum. The search for type specimens in the Stephani herbarium, at that time provisionally housed on the top floor of an old school building in Geneva, was a tedious job and eventually he gave up hepaticology altogether (Gradstein & Richards 1986). In the introduction of his dissertation, Verdoorn (1934) gave a brief assessment of Stephani’s scientific work and mental condition: “Evans, Schiffner und ich haben wiederholt auf derartig unmögliche Fehler, Verwechslungen und Auslassungen [in Species Hepaticarum] hingewiesen, dass man sich fragt, wie es wohl mit Stephani’s Geistesvermögen stand. Um dies zu untersuchen wandte ich mich nicht an Gegner von Stephani, sondern an Personen (Botaniker und Nicht-Botaniker) welche ihn gekannt haben und gern leiden möchten. Es gibt ein Sprichwort de mortuis nisi bene, und ich will hier daher nicht alles wiederholen was man mir mitgeteilt hat. Zwei Tatsachen dürften übrigens genügen: Dr. von Schoenau teilte mir persönlich mit, dass etwas Tabak in besonderer Form aus Goebel’s Pfeife gefallen und zwischen dessen australischen Sammlungen gekommen war. Das Stückchen Tabak wurde mit der Sammlung Stephani übersandt und kam pünktlich mit der Bezeichnung *Riccia glauca* zurück ... Eine andere Mitteilung machte mir Frl. Stephani, seine Tochter, bei einer Unterredung. Sie erzählte, dass Stephani seine Familie und Kinder nicht mehr wieder erkannte, aber noch recht fleissig an seinen Species Hepaticarum arbeitete. Fräulein Stephani sagte, es sei schließlich so schlimm geworden, dass sie dafür sorgte, ihm keine neuen Sammlungen mehr in die Hände gelangen zu lassen“ (p. 4-5). Later, Verdoorn admitted that the tobacco story may have been a fantasy of Karl von Goebel (Gradstein 1994). Frahm & Eggers (2001) came to the same conclusion and cited a letter from Goebel in which he tells the story. A piece of tobacco has never been found in Stephani’s herbarium.

In spite of all these criticisms, Species Hepaticarum retains its value as being the last morphological treatment of the species of liverworts and hornworts of the world. Of greater impor-

tance than the book itself, however, are Stephani's herbarium and his drawings. His personal herbarium, kept in Geneva, is one of the world's major reference collections of hepatics. It not only contains the types of almost all the species described by Stephani, but also numerous isotypes of older names. Stephani's original drawings, *Icones Hepaticarum*, total more than 12 000 plates (Geissler 1982). They were not published in *Species Hepaticarum* but various hand-copied sets were prepared after Stephani's death by his daughter Johanna and sold to make a living. Since 1985 they have been available on microfiche (Stephani 1985). It should be pointed out that Stephani usually wrote the descriptions based on the drawings, not on the plants themselves. For this reason, and because Stephani's collections are often fragments of samples kept in other herbaria, the *Icones* are of considerable importance for the study of the species described in *Species Hepaticarum*. They are an essential tool for the typification of the thousands of new species described by Stephani, because the legends of the plates usually provide detailed information on the label data of the specimen(s), which is lacking in the book. Moreover, many new species were based on more than one specimen. Thus, *Icones Hepaticarum* and the Stephani herbarium in Geneva are of crucial importance in dealing with the tidal wave of names created in *Species Hepaticarum*. Even though the revision of Stephani's species is still unfinished, preparation of an index of revised names to *Species Hepaticarum* would be very desirable. Such a list would undoubtedly add much to the usefulness of the work.

Acknowledgement

Brief accounts of the life and work of Franz Stephani have been published in German language, e.g. by Verdoorn, Frahm & Eggers and others, but apart from small bits and pieces by Schuster the story of *Species Hepaticarum* has to my knowledge not been told in English. It is a pleasure to dedicate this essay to Werner Greuter on the occasion of his retirement from his position as Director of the Botanic Garden and Botanical Museum Berlin-Dahlem. Also, I would like to thank Werner for his inspiring guidance of my MSc research on the hygrophytic vegetation of Crete, back in 1967, at a time when he was working at the herbarium of Geneva.

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Address of the author:

S. Robbert Gradstein, Department of Systematic Botany, Albrecht von Haller Institute of Plant Sciences, Untere Karspüle 2, 37073 Göttingen, Germany