



Dedicated to the memory of
F. A. W. MIQUEL

DEDICATION

The eighth volume of *Flora Malesiana* is dedicated to the memory of the Dutch botanist F. A. W. MIQUEL, who, even though he never visited the tropics, contributed greatly to the development of the knowledge of the Malesian flora. He did so not just through his well-known *Flora Indiae Batavae*, but certainly also through his rôle in re-activating the Rijksherbarium during and following the somewhat difficult aftermath of BLUME's reign, and in rallying the support of Dutch and foreign botanists to study the many collections from the 'East Indies' which reached the Netherlands in the years between 1840 and 1870. MIQUEL also played an inconspicuous, but as it turned out, decisive part in the introduction of *Cinchona* in Java and last, but not least, left an important heritage in the person of his pupil SCHEFFER who became director of 's-Lands Plantentuin (*Hortus bogoriensis*) at Buitenzorg (Bogor), Java, in 1868 and who had a profound effect on the development of the gardens as well as on botanical and agricultural research in the former Netherlands East Indies. The MIQUEL period in Dutch systematic and tropical botany was characterized by an enthusiastic attempt to lay a foundation for a better knowledge of the Suriname and Indonesian floras; attempts which resulted in a preliminary, even though not always sufficiently critical, survey of what was known. A well organized home-basis for systematic studies was set up in the revitalized Rijksherbarium, and through MIQUEL's own herbarium, sold to the University, a similar basis was established at Utrecht for the study of the Suriname flora. MIQUEL had good contacts with collectors in the field as well as with the gardens and herbarium at Buitenzorg (Bogor). At a time when the British colonial floras and the *Flora Brasiliensis* were written, he attempted to create at least a modest basis for similar Dutch activities for the study of the hitherto insufficiently recognized and described dazzling tropical organic diversity.

A brief biography is in order for this dedication as a late salute to a great botanist who could not even dream of the scope of the future *Flora Malesiana*, but who would have been one of its most enthusiastic supporters. For references to other literature and to sources I must refer to my more extensive biography and bibliography of MIQUEL published in 1966 and to the important collection of documents from which MIQUEL's relations with his colleagues in Holland and abroad can best be seen, namely the collection of letters written to MIQUEL, now in the Utrecht University Library. Frequent correspondence was entertained with, for instance, HASSKARL, HORSFIELD, JUNGHUHN, TEYSMANN and KURZ, to mention only a few of MIQUEL's more than 200 correspondents. These letters vividly illustrate the difficult conditions under which collectors and botanists worked, and often account for otherwise puzzling characteristics of the literature on the Malesian flora of the MIQUEL era.

FRIEDRICH ANTON WILHELM MIQUEL was born 24 October 1811 at Neuenhaus (near Bentheim) in the Prussian province of Hannover. Neuenhaus is a village less than five kilometers away from the Dutch-German border near Almelo, a location which had its effect on MIQUEL's future career. The closeness of the Netherlands and the nature of the border dialect made the choice of the University of Groningen as the place for MIQUEL's higher education understandable. A certain reservation with respect to liberal tendencies in German universities, developments which had not yet reached the Netherlands, may also have influenced what must essentially have been MIQUEL's father's decision to send his son to Groningen. The father, a regional physician with a thorough classical background, had laid the foundation for MIQUEL's excellent knowledge of Latin, the language still used at the time in many of the courses given at Dutch universities. By going to Groningen in 1829, MIQUEL turned Dutch: in his later years he spoke Dutch without an accent, considered himself a Dutchman and was fully accepted as such by society and government.

MIQUEL chose medicine as his major study and took his degree in 1833 on a dissertation on the merits of the classical writers with respect to the liver. During his study, however, MIQUEL had followed the courses given by H. C. VAN HALL, professor of botany and rural economy. His relationship with VAN HALL soon became closer than would have been usual between a young medical student and a university professor. As early as 1832 MIQUEL published his first botanical paper in the form of a treatment of various groups of cryptogams for VAN HALL's *Flora Belgii*

The photograph on the opposite page is made from a lithograph by P. BLOMMERS, after a drawing by A. J. EHNLE. 1854. *Courtesy Universiteitsmuseum, Utrecht.*

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Septentrionalis. In later years, when MIQUEL had evolved beyond his botanical master in scholarship and social status, relations with VAN HALL became sometimes more strained but even so remained mutually respectful. VAN HALL had one other pupil who, like MIQUEL, became involved in the study of the flora of the East Indies: P. W. KORTHALS (1807–1892), botanist and philosopher, member of the famous *Natuurkundige Commissie voor Nederlandsch Indië*. This Commission, founded 1820, was set up by the Government for the scientific exploration of the Netherlands Indies in the fields of botany, zoology, geology, etc. KORTHALS left Groningen before MIQUEL arrived, but the men met later on various occasions.

In later years MIQUEL was, to put it mildly, not exactly enthusiastic about his Groningen training. However, he would hardly have been more enthusiastic had he studied at any other Dutch University. Academic life in Holland in the early 1830s was on the whole rather sleepy and provincial, still full of the spirit of restoration rather than that of science as a rapidly developing human cultural endeavour per sé, such as MIQUEL learned to recognize and help develop in his later years. The essential urge towards inquisitiveness was usually not particularly evident in University circles. Many scientists of the period were still caught by an antiquated set of eighteenth century ideals, notions of utilitarianism, and an emphasis on idealistic speculation rather than on independent and inductive research with an international outlook.

MIQUEL left Groningen for Amsterdam in 1833, only to return to his Alma mater, to my knowledge, in September 1850 when Groningen University gave him an honorary degree in the natural sciences; a significant tribute mainly due to his old teacher, VAN HALL.

The first years of MIQUEL's professional career were spent in Amsterdam where he accepted a position as resident physician at the St. Pieters Buiten-Gasthuis, a hospital outside the city limits for infectious and mental diseases. The hospital was considered a very unhealthy place to live in, also for physicians (his friends called it a 'moordhol' (cut-throat den)) and MIQUEL left it, albeit reluctantly, after two years, when an opportunity presented itself to combine botany and medicine. It is not unlikely, although difficult to prove, that the assertion by MIQUEL's friend G. J. MULDER, in his Miquel obituary, that MIQUEL contracted the disease which would prematurely fell him in 1871 during his early Amsterdam years, is correct.

The position offered at Rotterdam was a combination of an ordinary private medical practice with the positions of director of the Rotterdam botanical garden and lecturer in botany at the medical school. Within a short time MIQUEL's activity switched towards physiological, morphological and taxonomic botany with work on living plants; studies which made him mature as a botanist. From 1835 onward we witness a rapid development towards that amazing productivity which would characterize MIQUEL until the very end. His attention went first of all to the cycads and cacti of the botanical garden. During these Rotterdam years MIQUEL established contacts with many foreign botanists: LEHMANN at Hamburg, SCHLECHTENDAL at Halle, DECAISNE and MONTAGNE at Paris, the HOOKERS at Kew, and, in the 1840s, also with East Indian botanists such as HASSKARL, TEYSMANN and ZOLLINGER. The contact with LEHMANN was set up in 1836 through the regular channels of seed-exchange; that with SCHLECHTENDAL, in the same year, aimed at finding his way towards the columns of *Linnaea* and the *Botanische Zeitung*. With this early correspondence MIQUEL presented himself as a botanist seeking international recognition and collaboration.

The correspondence with SCHLECHTENDAL, extending through 1866, just before the death of the botanist from Halle, is a highly interesting running commentary on the development of European botany in the mid-nineteenth century, bringing gossip as well as news on major developments, personalities, events, and on the emerging of new ideas. It provides us, for instance, with an insight into MIQUEL's development as a systematist working on tropical floras, into the motivation behind his activities as a national science politician and in general into his attitude as an individual scientist enthralled by organic diversity.

MIQUEL's first contacts with Suriname were established in 1837 when the first consignments of neotropical plants collected by HENRI CHARLES FOCKE came in. Not having a herbarium of any importance himself and not being connected with a center from which duplicates might be distributed, MIQUEL had only his publications to offer but even so managed to bring together a collection of plants mainly from Suriname, the Antilles, and Mexico, as well as collections obtained from the *Esslinger Reiseverein*.

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The Rotterdam years went by rapidly with many-sided activities in which MIQUEL's strengths and weaknesses became evident. His main strength derived from his enthusiastic and open approach to a great variety of botanical problems; his main weakness was that with his astonishing productivity he sometimes tended towards superficiality: there was so much to do and to enjoy in botany. His floristic beginnings had not really lasted long; towards the end of his Rotterdam years MIQUEL was an all-round taxonomist seeking to integrate findings in anatomy, morphology, physiology, lifecycles and descriptive taxonomy.

In 1840 MIQUEL married CATHARINA ELISABETH MADRY, a daughter of a leading Rotterdam banker. This marriage resulted in a socially and economically somewhat more relaxed life, but this reasonable affluence certainly did nothing to diminish MIQUEL's scientific activities. Between 1840 and 1846, for instance, he started on revisions of the large genera *Piper*, *Ficus* and *Casuarina*. His growing scientific standing was also reflected by career opportunities: after loosing a competition for a botanical chair at Leiden University (W. H. DE VRIESE carried that prize away), MIQUEL was appointed professor of medical botany at the Amsterdam 'Athenaeum' in 1846. In that same year MIQUEL was elected member of the 'Instituut', the forerunner of the present Royal Netherlands Academy of Sciences.

"Jetzt werde ich all meine Zeit und all meine Kräfte der Botanik widmen können und da meine Gesundheit sich bedeutend gebessert hat, erwartet mich eine schöne Zukunft" (letter to SCHLECHTENDAL, 1 February 1846). This bright future would include the definitive shift towards work on the flora of the Far East. With no medical practice necessary any longer to earn his living, MIQUEL became a full-time plant taxonomist when he moved to Amsterdam. Here he found a richly stocked botanical garden although still no herbarium to speak of. His period of being a 'Privatgelehrter', a self-made scientist, who wrote his best work in the evening hours, was behind him. Professional recognition and a regular scientific position enabled MIQUEL from now on to play an important rôle in the development of botany in the Netherlands. This chance was eagerly taken. During these first years in Amsterdam various minor herbarium collections from the East Indies came to the hands of MIQUEL, in part directly through his association with HASSKARL, JUNGHUHN, and TEYSMANN, partly indirectly through HOHENACKER and his Esslingen society.

However, during his first years in Amsterdam MIQUEL was still heavily involved in other enterprises. ALPHONSE DE CANDOLLE unsuccessfully tried to obtain his collaboration to work up the *Lauraceae* for the *Prodromus*. MARTIUS (who paid a honorarium) had better luck: MIQUEL wrote up the *Piperaceae*, *Urticaceae* (in a wide sense) and several other families for the *Flora Brasiliensis*. MARTIUS became one of his dearest pen-friends: the number of letters exchanged between the two men comes near to that written between SCHLECHTENDAL and MIQUEL. The quality of the work for the *Flora Brasiliensis* is among MIQUEL's best, possibly because its format required a critical, actually almost monographic revision of the groups in question and also because all important collections were made available to him.

The main shift towards the botany of the East Indies came in 1848. In that year FRANZ WILHELM JUNGHUHN (1809-1864), the German surgeon who, during his employment by the government of the Dutch East Indies had become one of the most important scientific travellers in Java and Sumatra, returned to Holland on European leave. He brought a sizeable herbarium which he wanted to have studied by the Dutch taxonomists. It would have been natural to deposit his rich collections at the Rijksherbarium, but this was something JUNGHUHN definitely did not wish. The director, C. L. BLUME, had become more and more difficult in his relations with others and more and more reluctant to unpack the collections received from the East for the benefit of taxonomists not connected with the Rijksherbarium. In principle he was of the opinion that all collections made by government employees anywhere in the world, whether officially or even unofficially in their spare time (as was more or less the case with JUNGHUHN), should come to the Rijksherbarium. This principle was certainly sound as long as it was applied in such a way that qualified botanists, at home and abroad, would have free access to the collections. In his later years, however, BLUME tended to 'reserve' the newly arrived materials for himself. BLUME was probably by far the best taxonomist in the Netherlands of his time. He was publishing his sumptuous *Rumphia* and his *Flora Javae*, nicely executed folio works with good coloured illustrations. These works were among the best of their type at the time, certainly in scientific respect. BLUME had published

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a great many new taxa between 1825 and 1827, while still at Buitenzorg, in the more sketchy *Bijdragen*. The diagnoses in the *Bijdragen*, unlike those in his later works, were often too concise for ready recognition. Other taxonomists seem to have had difficulties in obtaining BLUME's original material on loan for comparison or revision. BLUME's attitude did little to gain him friends and in the years 1848–1850 we find BLUME standing alone and fighting a losing battle against those he considered to be his enemies.

MIQUEL became involved when he was given the opportunity to study parts of JUNGHUHN's herbarium. On 30 June 1849 JUNGHUHN wrote to MIQUEL [translated]:

"In the meantime I have already from the beginning thought of you with respect to my Javanese and Sumatran herbarium and I have entertained the wish that you would take part in working it up." DE VRIESE and MOLKENBOER, in Leiden, had already sorted and arranged it provisionally, and MIQUEL was invited to come to Leiden and to discuss the work. "The conditions under which I have presented this herbarium, which was assembled by me in former years during my service as a medical officer, to the Government, were: that as long as Mr C. L. BLUME is director, the herbarium is not to be buried in the so-called Rijksherbarium, but that it may be available for research by Dutch botanists and myself. If these conditions are not accepted, the herbarium remains my property." The government accepted the conditions, thereby publicly repudiating its own servant BLUME in the official Rijksherbarium. The herbarium was placed under the care of W. H. DE VRIESE in his capacity of professor of botany and director of the botanic garden at Leiden. MIQUEL writes to SCHLECHTENDAL (28 October 1849): "Die Regierung hat darin zugestimmt und also ein aveu gegeben das dem Reichsherbar nicht zur Ehre dient. Und mit Recht."

The next step taken to obtain access to the collections from the East Indies was by MIQUEL and DE VRIESE separately. Both addressed themselves formally to the minister of the interior, THORBECKE, with complaints and a request for a new instruction for the director of the Rijksherbarium. It is not necessary to spell out the details. One phrase from the DE VRIESE's letter may suffice to show the unnecessarily acrimonious character of the quarrel [translated]: "[The Rijksherbarium] was never anything else but the focus of the morbid ambition of a single man . . ." MIQUEL's argument had mainly been that he had received complaints from foreign botanists. It is true that in the letters addressed to him, we find indeed several very critical remarks about BLUME. The Leipzig botanist GUSTAV KUNZE, for instance, wrote to MIQUEL on 18 January 1849 "Ich habe bei mehreren Gelegenheiten darauf hingedeutet . . . dass über seine früher beschriebenen Pflanzen kein Aufschluss zu erhalten ist." After first having tried to convince BLUME in private, by letter, to change his policy, THORBECKE came to the conclusion that the only solution would be to issue publicly a new instruction. The ukase came off on 11 November 1850 and was published in the *Staatscourant*. Reprints were sent to various botanical journals. MIQUEL comments to SCHLECHTENDAL: "Jetzt hat endlich die Regierung einen wichtigen Schritt gethan und eine sehr liberale Instruktion für ihn *i.e.* Blume ausgefertigt, die Sie wahrscheinlich schon kennen werden da der Minister Massregeln getroffen hat dass auch *apud exteros* diese eigentlich strafende Instruktion bekannt werde."

The instruction made a great difference and, strictly speaking, went even a little too far into the other direction. All material of any group, but not more than that of one family at the same time, had to be given on loan on request to botanists of acknowledged standing. The director was allowed to retain "a few families" for his own studies in his spare time [*sic!*]; he was no longer allowed to make use in his publications of manuscript annotations by others. Duplicates had to be distributed on a liberal scale.

Although the instruction was carried out by BLUME in a very incomplete way, as would become clear in 1861 when MIQUEL became director, the immediate result was that some of the undetermined collections became available for study by others.

Through his access to JUNGHUHN's herbarium MIQUEL's interest in the flora of the Dutch East Indies had become distinctly pronounced. He undertook to elaborate this large herbarium with its many novelties in collaboration with various specialists, which resulted in the *Plantae Junghuhnianae* of which five instalments appeared.

During this work a plan matured to undertake an enumeration of everything known on the flora of the Dutch East Indies by which *Plantae Junghuhnianae* would be superseded and hence

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discontinued. This new work would then be based on the published literature, new information from the collections of the Rijksherbarium, the HORSFIELD collections, those of ZOLLINGER, the remaining material of JUNGHUHN, REINWARDT's private herbarium, and specimens recieved from TEYSMANN, as well as all other collections MIQUEL could lay hands on.

In the course of 1854 MIQUEL sought the help of the government for his plan to write a *Flora Indiae Batavae*. JUNGHUHN enthusiastically supported the project with the government and towards the end of the year MIQUEL had received sufficient safeguards to make a beginning. Publication took place rapidly. The first part appeared on 2 August 1855. The presentation was modest and with a minimum of illustrations, the latter as always by his friend VER HUELL. The circa 3700 pages and 41 plates appeared in slightly over four years: the last part was published on 29 December 1859 when MIQUEL was already at Utrecht. In sheer size the *Flora* is matched among MIQUEL's publications only by his later *Annales*. The book constitutes the first comprehensive flora of the Malesian area and was evidently inspired by the *Flora Brasiliensis*, though published in the style of DE CANDOLLE's *Prodromus*. The descriptions are in Latin, the notes (mainly on use, pharmaceutical properties, and distribution) in Dutch; there are no keys. A virtue of the work is its sound delimitation in that not only descriptions of plants were incorporated from the Dutch East Indies proper, but also those from the Philippines and Malaya, and even common ones from British India which MIQUEL, being aware of its inadequate exploration, assumed might also occur in the Dutch East Indies.

In his introduction to the first volume MIQUEL stated some of his basic principles (pp. viii, ix). "I do not aim at the applause of those who seek the good of science in the multiplication of species and genera . . . Not he who adds most new names to the lists of plants, but he who tries to clear them from all those products of thoughtlessness and self-love, promotes true science. The principles of a correct evaluation of the differentiating characteristics of species must be found in the realm of organography, anatomy, and physiology, in order that the plant does not present itself to the mind of the taxonomist as an unchanging being such as the dried herbarium specimen. He must trace the laws of plant distribution in order to learn to distinguish the effect of all outside influences which modify the shape of the species in combination with the gradual changes in the development of the organs. Only in this way can he obtain a correct delimitation of the species." It cannot be denied that, though stated in the language of his time, the principles were advanced. They were rather similar, though more concise, to the principles laid down by J. D. HOOKER in his famous *Introductory Essay* in his *Flora Indica* (1855). Herbarium specimens alone are not to be trusted, characteristics derived from other branches of botany have to be taken into account. Undue splitting is harmful and to nobody's advantage. The variability of species is to be taken seriously.

It is still not quite clear to what extent MIQUEL really benefited from the new instructions to the Director of the Rijksherbarium when writing his *Flora Indiae Batavae*. If at all, the direct benefit of his efforts to make the riches of the state herbarium available to an outsider such as he was, must have been small. After his appointment as director of the Rijksherbarium (1871) MIQUEL discovered sizeable unconsulted collections of material from the East Indies awaiting to be worked upon by systematists. Actually MIQUEL worked mainly with the material made available to him by HORSFIELD, JUNGHUHN and ZOLLINGER as well as with the considerable collections received by him directly from TEYSMANN at Bogor which included also HASSKARL material.

MIQUEL described the situation to SCHLECHTENDAL in his letter of 16 February 1856. He stated that he had a good set of ZOLLINGER's material in his private herbarium and that the remaining numbers had been sent on loan to him by the Comte DE FRANQUEVILLE in Paris who bought ZOLLINGER's herbarium. HORSFIELD has sent him his "entire herbarium" (actually one set which had been made as complete as possible) to be used for the work on his *Flora*. The herbaria in Holland "sind alle für mich geöffnet und trotz H. Blume habe ich den freien Gebrauch des Reichs Herb. Mein Material ist also wohl sehr gross und ich arbeite mutig daran und hoffe es so weit zu bringen, dass ich wenigstens das zerstreute . . . Material zu einem ganzen zusammen-trage." Even so the availability of the Rijksherbarium material must not be overestimated. After all MIQUEL could not go there and select the material himself, neither BLUME type-material nor new not yet unpacked collections. The rules entitled him to receive family by family on loan; we cannot now know to what extent the material received was in any way complete.

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The situation was in all probability not as rosy as MIQUEL depicted it and this was a considerable disadvantage. MIQUEL was eager, too eager perhaps, to lay his hands on any scrap of unidentified material and was often not critical enough to reject incomplete specimens. This is especially evident in his later supplement to the *Flora*, mentioned below, but this weakness was not absent either from his work on the *Flora* proper. Furthermore there was — clearly illustrated by his statement in letters to others — this tremendous urge to do a fast job. The result was a compilation of use to the contemporary botanist, but of lesser value to the botanist of the future (VAN STEENIS, in litt.). The Kew Floras followed a more enlightened path: critical revision and consultation of authentic material was pre-eminent in the work on the *Flora Indica*, later resumed as the *Flora of British India*, the *Flora Hongkongensis*, and later colonial floras.

Not a critical, really creative flora, therefore, but more modestly a summing up of what was known in the absence of any other up-to-date comprehensive review of the immense diversity of the Malesian flora. A diversity of which MIQUEL could have no adequate picture simply because of the too small number of collections available to him (however plentiful they may have seemed), but certainly also because he himself had never visited the tropics. He must have become aware of these circumstances when he received new material from TEYSMANN collected in Sumatra supplemented by material from other collectors such as DIEPENHORST, ZOLLINGER and SULPIZ KURZ (J. AMMAN) which led him to write one of his lesser successes in phytochemistry, the *Prodromus Florae Sumatranæ* (1860–1861), published as a first supplement (not followed by any further instalments) to the *Flora Indiae Batavae*. In his introduction MIQUEL admits that contrary to (his own) expectations that the vegetation of Sumatra differed little from that of Java, it appeared that when the hitherto unknown inner parts of the island were explored the botanical diversity of Sumatra (and Borneo) proved to be unsuspectedly high. The book itself repeats the information given on collections from Sumatra in the *Flora* followed by a rather uncritical description of new taxa often based on insufficient material. MIQUEL would do much better later in his smaller revisions published in the *Annales*.

This astonishment is also evident from the letter to SCHLECHTENDAL of 7 March 1858 reporting on the progress of the *Flora*. It is perhaps good to quote MIQUEL himself in his assessment of the undertaking when the end was in sight. From this letter it becomes clear that the immense diversity started to baffle him as collection after collection was sent to him to be taken into account. He had obviously underestimated the colossal wealth of the tropical floras. However, he made a valiant attempt to master single-handedly a task which even at that time was already too heavy for him: "Mit meiner Flora schreite ich regelmässig vorwärts. Meine Hauptidee ist dabei, das Bekannte gehörig geordnet mit möglicher Kritik nach den Original-Exemplaren zusammenzustellen und dabei soviel möglich das existierende unbearbeitete Material zu verarbeiten. Ich begreife recht gut, dass das ganze nur ein sehr unvollständiges Bild dieser reichen Flora geben wird aber ich glaube doch dass zur weiteren Ausbildung dieser Flora, zumal in den Händen der ziemlich zahlreichen Botaniker die sich jetzt in unseren indischen Kolonien befinden, eine solche Grundlage Nutzen stiften wird. Von vielen Gruppen wussten wir bis jetzt nichts und ich habe wenigstens so viel Material dass ich ein allgemeines Bild davon entwerfen kann. Mein Material wächst aber täglich gewaltig heran, die eine Kiste folgt der anderen und ich erstaune täglich mehr über diesen unerschöpflichen Reichthum!"

We cannot further follow MIQUEL's very varied career as a scientist as well as a science-politician in any detail and must restrict ourselves mainly to his further activities in palaeotropical botany. We can also not touch on MIQUEL's rôle in the introduction of *Cinchona* into the Dutch East Indies nor on his work as a palaeobotanist and as a popular writer. All these facets of his versatile genius became apparent during the busy years in Amsterdam which lasted until 1859. In that year the chair of botany at the University of Utrecht became vacant and MIQUEL eagerly accepted appointment. His health was frail as ever and he enjoyed the possibility to move to a town almost free of malaria. Also, MIQUEL wanted to work in a 'real' University. The Amsterdam 'Athenaeum' was a college which did not lead to a doctor's degree; for this the students had to go to one of the universities. From his inaugural address delivered in the year of the *Origin of species*, it becomes clear that MIQUEL moved toward a biological species concept and towards rejection of the ancient dogma of the fixity of species in exchange for what he called the change of a species into a number of different series which reproduce independently. In later years

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MIQUEL did not return to this issue in print and we know but little of his ideas as presented in his teaching.

Utrecht provided MIQUEL with the opportunity to have graduate students. Actually, though he had quite a few pupils, most of them moved towards morphology, anatomy and physiology. Only two systematists took their degree with him. It was a source of constant regret to MIQUEL that he could not attract more pupils. The first of the systematists, P. DE BOER, wrote a thesis on the conifers of the Malayan Archipelago, but he did not continue in taxonomy. The second, R. H. C. C. SCHEFFER, took his degree in 1867 on a thesis on Malesian *Myrsinaceae*; he soon went to Java, where, upon MIQUEL's recommendation, he became the third director of 's-Lands Plantentuin, the Botanic Garden at Buitenzorg (Bogor) in 1868, a post left vacant since BLUME had left in 1826; in the long interval the garden having been under the care of the famous curators TEYSMANN and BINNENDIJK. SCHEFFER turned out to be an excellent director who laid the foundation for the expansion of botanical and agricultural research in the archipelago and as such can be said to have carried on the torch lit by MIQUEL.

The main event of the Utrecht years (1859–1871) was MIQUEL's appointment as director of the Rijksherbarium in Leiden, a function to be combined with his professorship in Utrecht.

Both BLUME and DE VRIESE died in the beginning of 1862, and thus both the directorate of the Rijksherbarium and the professorship of botany at Leiden became vacant. The formidable statesman THORBECKE, who had so effectively supported MIQUEL in 1850 in 'opening' the Rijksherbarium, was still in power. He first turned to MIQUEL to fill the vacancies because the latter now ranked indisputably first among his fellow-botanists in the Netherlands. It is interesting and revealing to let MIQUEL tell himself — again in a letter to SCHLECHTENDAL — the story of his dual appointment, and the reasons for his refusal to live at Leiden (18 May 1862):

“Die Regierung war mit der Sache sehr verlegen. Das Reichsherbarium hatte der Regierung wenig Freude gemacht, viel Geld gekostet; so lange Blume lebte konnte und wollte man nicht eingreifen. De Vriese's Tod erhöhte die Schwierigkeit, denn man fand Bedenken den jungen Dr. Suringar, der nur für de Vr[iese's] Abwesenheit als Prof. extraord. angestellt war, zu dessen Nachfolger in der bot. Professur zu proclamieren. Es wurden nun beide Stellen mir vereinigt angeboten und der Minister wollte mich durchaus nicht loslassen; er wies mich auf meine Verpflichtung gegenüber die Wissenschaft u.s.w. Da ich aber mich hier in Utrecht ganz wohl fühle und in dieser freundlichen und gesunden Stadt mit meiner Familie viele Elemente des Lebensglücks finde, hier mit meinen Collegen in dem angenehmsten Verhältniss stehe, hatte ich wenig Lust nach dem fieberreichen Leiden, dass ausserdem eine sehr stille Stadt ist, mich zu begeben. Das Endresultat ist nun, dass man an Suringar den Lehrstuhl der Botanik übertragen hat und dass ich zum Director des Reichs Herbarium ernannt bin, zugleich aber hier an der Universität bleibe. Die Eisenbahnverbindung macht diesen Zustand möglich, wobei gewiss meine Thätigkeit sehr in Anspruch genommen werden wird. Ich hoffe nun das Reichsherbarium so viel möglich dem In- und Auslande offen zu stellen damit die Massen von unbearbeitetem Material der Wissenschaft zum Nutzen werden können.”

The change-over did not take place without difficulties. MIQUEL had to dismiss the curator H. VAN HALL, the son of his old teacher H. C. VAN HALL, thus reducing the staff of the Rijksherbarium (in addition to himself) from three to two. Angry protests followed from certain Leiden quarters which found expression in the debates in the house of representatives ('Tweede Kamer') on 25 November 1862. The member for Leiden was not at all pleased and greatly objected to the new policy. The debate in the House revealed some interesting aspects of the state in which the Rijksherbarium had been found after BLUME's death. THORBECKE faithfully stood by his choice of MIQUEL. Not published was the fact revealed by the archives of the Leiden Rijksherbarium that THORBECKE had wanted MIQUEL to dismiss two of the three employees of the Rijksherbarium. The dismissal of only one was a typical MIQUEL compromise.

MIQUEL attacked the new challenge with energy and, again, in haste. Thanks to the better facilities, his published work was now mostly of a higher quality than for instance his rushed job on the Flora of Sumatra. It became clear that those rooms of the Rijksherbarium which had not been open to other botanists contained a wealth of unworked collections. MIQUEL obtained the collaboration of many colleagues in Europe and the United States to identify and describe the material from Eastern Asia. For the publication of the results of these studies on Malesian and

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Japanese plants MIQUEL started a sumptuous folio-journal, the *Annales Musei Botanici Lugduno-Batavi*. The format was chosen, just as was that of the later Annals of the R.B.G. Calcutta, to accommodate an ample choice of good illustrations. MIQUEL himself was the author of many of the papers, but we encounter many other names as well: METTENIUS, MEISNER, SCHOTT, HASSKARL, C. KOCH, R. CASPARY, S. KURZ, OUDEMANS and MIQUEL's pupils DE BOER and SCHEFFER.

MIQUEL, characteristically, was eager to work up the collections for again another area: Japan. A long series of papers in the *Annales* on the Japanese material was also separately published as the *Prolusio Florae Japonicae*.

The scientific papers followed each other in quick succession, the subjects dealt with varied greatly, and the style became more concise. There was so much to do and so little time left. How MIQUEL succeeded in combining the Leiden and Utrecht posts with this feverish scientific activity is a mystery. Even when one takes into account that the official duties were less heavy than they are to-day, it remains difficult to imagine how MIQUEL succeeded in constantly keeping up his scientific production. It is known that MIQUEL seldom prepared his courses, and that he worked until only a few minutes before the appointed hour, to resume his writing again immediately after. There was, however, also a busy correspondence with colleagues abroad and with the East Indies; there were the affairs of the Academy of Sciences, and, not least, the frequent visitors.

MIQUEL's official reports on the activities of the Rijksherbarium bring other proof with respect to his energy and organisational skill. On 20 January 1871 MIQUEL wrote his annual report for 1870. He died three days later, on 23 January, 59 years old. The last words of this report, probably the last text he wrote at all, contained a summing up of the tasks of the Rijksherbarium which (freely translated) "will be mainly dedicated to the study of the plant world of the Indonesian archipelago. If one takes into consideration the wealth of that flora and its very special character, our Herbarium will always be regarded as an important institution . . ."

After MIQUEL's death it would take some time until the importance of the institution was again fully realized. There was no real successor to MIQUEL nor was there a school of systematists. Forty years had to go by before tropical botany was revived again in the Netherlands, thanks to the foresight of F. A. F. C. WENT and through the activities of his pupil A. A. PULLE, both Utrecht scientists and successors to the heritage of MIQUEL.

F. A. STAFLEU

BIOGRAPHICAL SOURCES

STAFLEU, F. A. 1966. F. A. W. Miquel, Netherlands botanist. *Wentia* 16: 1-95 (*q.v.* for further references and full bibliography).

STAFLEU, F. A. 1970. The Miquel-Schlechtendal correspondence, a picture of European botany, 1836-1866. *Regnum vegetabile* 71: 295-341.

Archives Rijksherbarium, Leiden.

Miquel correspondence, collection of letters received by Miquel from botanists at home and abroad. University Library, Utrecht (*c.* 1000 letters from *c.* 200 botanists).

Schlechtendal correspondence, letters written by Miquel to Schlechtendal. Institut für systematische Botanik und Pflanzengeographie der Martin-Luther Universität, Halle-Wittenberg, D.D.R.

BIBLIOGRAPHY OF MIQUEL'S WORKS ON MALESIAN BOTANY

Extracted from STAFLEU's biography.

No mention is made of MIQUEL's reviews of papers dealing with Malesian botany.

Though naturally Malesian species were included in MIQUEL's monographic works on *Cycadaceae*, *Casuarina*, *Ficus*, and *Piperaceae*, these works are not cited.

Dedication

The *Annales Musei Botanici Lugduno-Batavi* (1863–1869) contain several dozens of important additions and new revisions of Malesian plants. These have not been cited separately, as has been done in STAFLEU's bibliography.

The same procedure has been followed with *Plantae Junghuhnianae* (1851–1857).

Several papers and books were published in instalments; the exact publication dates are cited in detail in STAFLEU's bibliography.

1839

Commentarii phytographici, quibus varia rei herbariae capita illustrantur. Fasciculus I (S. & J. Luchtman, Leiden: pp. i–iv + 1–29, tt. i–iii).

Mélanges botaniques (Bull. Sci. Phys. Nat. Néerl.: 37–48).

1840

Commentarii phytographici, quibus varia rei herbariae capita illustrantur. Fasciculus II–III (S. & J. Luchtman, Leiden: pp. i–iv + 31–146, tt. iv–xiv).

1845

Pterisanthus cissoides Bl. illustratio (Linnaea 18: 385–397).

1848

Aeschynanthi speciem novam proponit . . . (Bot. Zeitung 6: 509–510).

Piperaceae Reinwardtianae (Linnaea 21: 480–486).

1850[–1852]

Analecta botanica indica seu commentationes de variis stirpibus asiae australioris. Pars I (Verh. Eerste Klasse Kon. Ned. Inst. Wet. ser. 3, 3, 1850, 1–30, tt. i–x); Pars altera (*ibid.* 4, 1851, 13–56, tt. i–vii); Pars III vel posthuma (*ibid.* 5, 1852, 1–30, tt. i–iii).

1851[–1857]

(Ed.) *Plantae Junghuhnianae*. Enumeratio plantarum, quas in insulis Java et Sumatra, detexit Fr. Junghuhn (A. W. Sythoff, Leiden: 5 fasc., 1851–1857, 572 pp.).

1853

Cycadis Rumphii stirpis femina (Linnaea 25: 589–592, t. ii).

1854

Excerpta observationum de *Rafflesia Rochussenii* femina editarum, cum annotatione epicritica (Linnaea 26: 224–234).

De ramificatione monstrosa in arbore Sumatрана observata (Linnaea 26: 285–291, t. iii).

Monochlamydeen. In: H. Zollinger, Systematisches Verzeichnis der im indischen Archipel in den Jahren 1842–1848 gesammelten sowie der aus Japan empfangenen Pflanzen. Heft 2: 80–119.

1855[–1859]

Flora van Nederlandsch Indië (alternative title *Flora Indiae Batavae*) (G. C. van der Post, Amsterdam: 3 volumes, 1855–1859).

Voorlopig berigt over eene nieuwe *Wolffia* (Ned. Kruidk. Arch. 3: 425–429; Nat. Tijd. N. I. 10: 399–402. 1856).

1856

Araliacearum indicarum genera et species aliquod novae (Bonplandia 4: 137–139).

Aroideae novae javanicae (Bot. Zeitung 14: 561–565).

1857

Rhodoleiae (Champ.) generis hactenus dubii characterem, adjectâ specie sumatranâ (Versl. Med. Kon. Akad. Wet. afd. Natuurk. 6: 122–128).

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Nova genera Apocynearum indicarum (Versl. Med. Kon. Akad. Wet. afd. Natuurk. 6: 191–194).

Araliaceae (and various other families). In: W. H. de Vriese, *Plantae Indiae Batavae Orientalis fasc. 2* (E. J. Brill, Leiden: pp. 81–160).

1860[–1861]

Flora van Nederlandsch Indië. Eerste Bijvoegsel. Sumatra, zijne plantenwereld en hare voortbrengselen. Met platen (alternative title *Flora Indiae Batavae. Supplementum primum. Prodromus florum Sumatranæ. Accedunt Tabulae IV*) (C. G. van der Post, Utrecht: pp. xxiv + 656, tt. 4. 1860–1861).

1861

Revue des Palmiers de l'île de Sumatra (*J. Bot. Néerl.* 1: 1–29).

1862

Remarques sur quelques espèces de *Nepenthes* (*J. Bot. Néerl.* 1: 272–280, tt. i–ii).

Remarques sur le genre *Nania* (*J. Bot. Néerl.* 1: 292–297, t. iii).

Ueber Kaju Garu, ein wohlriechendes Holz in Indien, von Teysmann und Binnendijk, Vorstehern des botanischen Gartens in Buitenzorg in Java, mitgeteilt von Prof. Miquel (*Bot. Zeitung* 20: 265–266).

Sumatra, seine Pflanzenwelt und deren Erzeugnisse (German edition of *Flora Indiae Batavae*, Suppl. I) (C. G. van der Post, Amsterdam: pp. xxiv + 656, tt. iv).

1863[–1869]

(Ed.) *Annales Musei Botanici Lugduno-Batavi* (C. G. van der Post, Amsterdam: 4 volumes, 1863–1869).

1864

Choix de plantes rares ou nouvelles cultivées et dessinées dans le jardin botanique de Buitenzorg (C. W. Mieling, 's-Gravenhage: 26 col. lithogr. plates + 30 pp. text).

Calpicarpum albiflorum Teysm. et Binnend. (*Jaarb. Kon. Ned. Maatsch. Tuinbouw*: 29–32, t. i).

1868

De Palmis archipelagi indici observationes novae (*Verh. Kon. Akad. Wet.* 11: 1–33, t. 1).

1870[–1871]

Illustrations de la flore de l'Archipel Indien (C. G. van der Post, Amsterdam: pp. x + 114, tt. xxxvii. 1870–1871).

ABBREVIATIONS AND SIGNS

acc. = according
 Ak. Bis. = Aklan Bisáya (Philip. language)
 Alf. Cel. = Alfurese Celebes (language)
 alt. = altitude
 Anat. = Anatomy
 Ap. = Apáyao (Philip. language)
 app. = appendix, appendices
 appr. = approximate
 Apr. = April
 Arch. = Archipelago
 atl. = atlas
auct. div. = *auctores diversi*; various authors
auct(t). mal. = *auctores malayenses*; authors dealing with Malesian flora
auct(t). plur. = *auctores plures*; several authors
 Aug. = August
 Bag. = Bagóbo (Philip. language)
 basionym = original name of the type specimen; its epithet remains permanently attached to the taxon which is typified by it provided it is of the same rank
 Bg. = Buginese (language)
 Bik. = Bikol (Philip. language)
 Bil. = Bilá-an (Philip. language)
 Bill. = Billiton
 Bis. = Bisáya (Philip. language)
 Bon. = Bontók (Philip. language)
 Born. = Borneo
 Bt = Bukit; mountain
 Bug. = Buginese (language)
 Buk. = Bukidnon (Philip. language)
c. = *circiter*; about
 C. Bis. = Cebu Bisáya (Philip. language)
cf. = *confer*; compare
 Chab. = Chabecáno (Philip. language)
 citations = see references
 cm = centimetre
c.n. = see *comb. nov.*
comb. nov. = *combinatio nova*; new combination
 CS = cross-section or transversal section of an organ
c.s. = *cum suis*; with collaborators
cum fig. = including the figure
cur. = *curante*; edited by
 D (after a vernacular name) = Dutch
 Daj. = Dyak (language)
 d.b.h. = diameter at breast height
 D.E.I. = Dutch East Indies
descr. added behind a reference = means that this contains a valid description
 diam. = diameter
 Distr. (as an item) = Distribution
 Distr. (with a geographical name) = District
ditto = the same, see *do*
 Div. = Division, or Divide
div. = *diversus* (masc.); various
do = *ditto* (Ital.); the same
 Dum. = Dumágat (Philip. language)
 dupl. = duplicate
 E = east (after degrees: eastern longitude)
 E (after a vernacular name) = English
 Ecol. = Ecology
 ed. = edited; edition; editor
e.g. = *exempli gratia*; for examples
elab. = *elaboravit*; revised
em(end). = *emendavit*; emended
 em(erg). ed. = emergency edition
 Engl. = English
etc., &c. = *et cetera*; and (the) other things

ex auctt. = *ex auctores*; according to authors
excl. = *exclusus* (masc.); excluding, exclusive of
ex descr. = known to the author only from the description
f. (before a plant name) = *forma*; form
f. (after a personal name) = *filius*; the son
 f. (in citations) = figure
 fam. = family
 Feb(r). = February
fide = according to
 fig. = figure
fl. = *flore, floret (floruit)*; (with) flower, flowering
 For. Serv. = Forest Service
fr. = *fructu, fructescit*; (with) fruit, fruiting
 Fr. (after a vernacular name) = French
 G. = Gunung (Malay); mountain
 Gad. = Gaddáng (Philip. language)
gen. = *genus*; genus
genus delendum = genus to be rejected
 Germ. = German
geront. = Old World
haud = not, not at all
 holotype = the specimen on which the original description was actually based or so designated by the original author
 homonym = a name which duplicates the name of an earlier described taxon (of the same rank) but which is based on a different type species or type specimen; all later homonyms are nomenclaturally illegitimate, unless conserved
 I. = Island
ib(id). = *ibidem*; the same, in the same place
 Ibn. = Ibanág (Philip. language)
ic. = *icon, icones*; plate, plates
ic. inedit. = *icon ineditum, icones inedita*; inedited plate(s)
id. = *idem*; the same
i.e. = *id est*; that is
 If. = Ifugáo (Philip. language)
 Ig. = Igorot (Philip. language)
 Ilg. = Ilongót (Philip. language)
 Ilk. = Ilóko (Philip. language)
in adnot. = *in adnotatione*; in note, in annotation
incl. = *inclusus* (masc.); including, inclusive(ly)
 indet. = indetermined
 Indr. = Indragiri (in Central Sumatra)
inedit. = *ineditus* (masc.); inedited
in herb. = *in herbario*; in the herbarium
in litt. = *in litteris*; communicated by letter
in sched. = *in schedula*; on a herbarium sheet
in sicc. = *in sicco*; in a dried state
in syn. = *in synonymis*; in synonymy
 Is. = Islands
 Is. (after a vernacular name) = Isináí (Philip. language)
 Ism. = Isámal (Philip. language)
 isotype = a duplicate of the holotype; in arboreous plants isotypes have often been collected from a single tree, shrub, or liana from which the holotype was also derived
 Iv. = Ivatán (Philip. language)
 J(av). = Javanese (language)
 Jan. = January
 Jr = Junior
 Klg. = Kalinga (Philip. language)
 Kul. = Kuláman (Philip. language)
 Kuy. = Kuyónon (Philip. language)
 Lamp. = Lampong Districts (in S. Sumatra)
 Lan. = Lánao (Philip. language)

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- lang. = language
l.c. = *loco citato*; compare reference
 lectotype = the specimen selected *a posteriori* from the authentic elements on which the taxon was based when no holotype was designated or when the holotype is lost
 livr. = livraison, part
ll.cc. = *l.c.* (plur.)
 LS = longitudinal or lengthwise section of an organ
 m = metre
 M = Malay (language)
 Mag. = Magindanao (Philip. language)
 Mak. = Makassar, Macassar (in SW. Celebes)
 Mal. = Malay(an)
 Mal. Pen. = Malay Peninsula
 Mand. = Mandaya (Philip. language)
 Mang. = Mangyan (Philip. language)
 Mar. = March
 Mbo = Manobo (Philip. language)
 Md. = Madurese (language)
 Minangk. = Minangkabau (a Sumatran language)
min. part. = *pro minore parte*; for the smaller part
 mm = millimetre
 Mng. = Mangguangan (Philip. language)
 Morph. = Morphology
 ms(c), MS(S) = manuscript(s)
 Mt(s) = Mount(ains)
 n. = *numero*; number
 N = north (after degrees: northern latitude); or New (*e.g.* in N. Guinea)
 NE. = northeast
 nec = not
neerl. = Netherlands, Netherlands edition
 Neg. = Negro (Philip. language)
 N.E.I. = Netherlands East Indies
 neotype = the specimen designated to serve as nomenclatural type when no authentic specimens have existed or when they have been lost; a neotype retains its status as the new type as long as no authentic elements are recovered and as long as it can be shown to be satisfactory in accordance with the original description or figure of the taxon
 N.G. = New Guinea
 N.I. = Netherlands Indies
 no = *numero*; number
nom. = *nomen*; name (only) = *nomen nudum*
nom. al. = *nomen aliorum*; name used by other authors
nom. alt(ern). = *nomen alternativum*; alternative name
nom. cons(erv). = *nomen conservandum*, *nomina conservanda*; generic name(s) conserved by the International Rules of Botanical Nomenclature
nom. fam. cons. = *nomen familiarum conservandum*; conserved family name
nom. gen. cons. = see *nomen conservandum*
nom. gen. cons. prop. = *nomen genericum conservandum propositum*; generic name proposed for conservation
nom. illeg(it). = *nomen illegitimum*; illegitimate name
nom. leg(it). = *nomen legitimum*; legitimate name
nom. nov. = *nomen novum*; new name
nom. nud. = *nomen nudum*; name published without description and without reference to previous publications
nom. rej(ic). = *nomen rejiciendum*; name rejected by the International Rules of Botanical Nomenclature
nom. seminudum = a name which is provided with some unessential notes or details which cannot be considered to represent a sufficient description which is, according to the International Rules of Botanical Nomenclature, compulsory for valid publication of the name of a taxon
nom. subnudum = *nomen seminudum*
nom. superfl. = a name superfluous when it was published; in most cases it is a name based on the same type as an other earlier specific name
non followed by author's name and year, not placed in parentheses, and put at the end of a citation = means that this author has published the same name mentioned in the citation *independently*. These names (combinations) are therefore homonyms.
 Compare p. 268b line 9-7 from bottom. The same can happen with generic names.
 (*non* followed by abbreviation of author's name) before a reference (citation) headed by an other author's name = means that the second author has misinterpreted the taxon of the first author.
 Compare p. 7b line 3 from bottom: RETZIUS misapplied the name *Hypericum chinense* as earlier described by both OSBECK and LINNAEUS.
non. al. = *non aliorum*; not of other authors
non vidi = not seen by the author
nov. = *nova* (femin.); new (species, variety, *etc.*)
 Nov. = November
 n.s. = new series
n. sp. = *nova species*; new species
n. (sp.) prov. = *nomen (specificum) provisorium*; provisional new (specific) name
n.v. = *non vidi*; not seen
 NW. = northwest
 Oct. = October
op. cit. = *opere citato*; in the work cited
 p. = *pagina*; page
 P. = Pulau, Pulu (in Malay); Island
 Pal(emb). = Palembang
 Pamp. = Pampangan (Philip. language)
 Pang. = Pangasinan (Philip. language)
 paratype = a specimen cited with the original description other than the holotype
part. alt. = for the other part
 P. Bis. = Panay Bisaya (Philip. language)
 P.I. = Philippine Islands
 pl. = plate
plurim. = *plurimus*; most
p.p. = *pro parte*; partly
pr. max. p. = *pro maxima parte*; for the greater part
pro = as far as is concerned
prob. = *probabiliter*; probably
prop. = *propositus*; proposed
 Prov. = Province
pr.p. = *pro parte*; partly
 pt = part
quae est = which is
quoad basionym, syn., specimina, *etc.* = as far as the basionym, synonym(s), specimen(s), *etc.* are concerned
 references = see for abbreviations the list in vol. 5, pp. cxlv-clxv
 Res. = Residency or Reserve

Abbreviations and signs

resp. = respective(ly)
S = south (after degrees: southern latitude)
S (after a vernacular name) = Sundanese (language)
Sbl. = Sambáli (Philip. language)
SE. = southeast
sec. = *secus*; according to
sect. = *sectio*; section
sens. ampl. (ampliss.) = sensu amplo (amplissimo);
in a wider sense, in the widest sense
sens. lat. = sensu lato; in a wide sense
sens. str. (strictiss.) = sensu stricto (strictissimo).
in the narrow sense, in the narrowest sense
Sept. = September
seq., seqq. = sequens, sequentia; the following
ser. = series
s.l. = sensu lato; in a wide sense
S.-L. Bis. = Samar-Leyte Bisáya (Philip. language)
Sml. = Sámal (Philip. language)
s.n. = sine numero; (specimen) without the collector's number
Sp. = Spanish (language)
sp(ec). = *species*; species
specim. = specimen(s)
sphalm. = *sphalmate*; by error, erroneous
spp. = *species*; species (plural)
Sr = Senior
s.s. = see sens. str.
ssp. = subspecies; subspecies
s.str. = see sens. str.
stat. nov. = status nova; proposed in a new rank
Sub. = Subánúm (Philip. language)
subg(en). = *subgenus*; subgenus
subsect. = *subsectio*; subsection
subsp. = subspecies; subspecies
Sul. = Súlu (Philip. language)
Sum. E.C. = Sumatra East Coast
Sum. W.C. = Sumatra West Coast
Suppl. = Supplement
SW. = southwest
syn. = synonymum; synonym
synonyms = the names of taxa which have been referred to an earlier described taxon of the same rank and with which they have been united on taxonomical grounds or which are bound together nomenclaturally
syntypes = the specimens used by the original author when no holotype was designed or more specimens were simultaneously designated as type
t. = *tabula*; plate
Tag. = Tagálog (Philip. language)
Tagb. = Tagbanúa (Philip. language)
Tagk. = Tagaká-ólo (Philip. language)
Tapan. = Tapanuli (in NW. Sumatra)

taxon = each entity throughout the hierarchic ranks of the plant kingdom which can be described and discriminated from other taxa of the same rank
Taxon. = Taxonomy
Tg = Tandjung (Malay); cape
Ting. = Tinggián (Philip. language)
Tir. = Tirurái (Philip. language)
transl. = translated
type = each taxon above the rank of a species is typified by a type belonging to a lower rank, for instance a family by a genus, a genus in its turn by a species; a species or infraspecific taxon is typified by a specimen. The name of a taxon is nomenclaturally permanently attached to its type; from this it cannot be inferred that the type always represents botanically the most typical or average structure found in the circumscription of the taxon
type specimen = the specimen or other element to which the name of a species or infraspecific taxon is (nomenclaturally) permanently attached; botanically a type specimen is a random specimen on which the name was based by description. Therefore, it does not need to represent the average or most typical representative of a population. See holotype, isotype, lectotype, syntype, paratype, and neotype
typ. excl. = typo excluso; type excluded
typ. incl. = typo incluso; type included
typus = see type and type specimen
var. = varietas; variety
var. nov. = varietas nova; new variety
Vern. = Vernacular
vide = see
viz = videlicet; namely
vol. = volume
W = west (after degrees: western longitude)
Yak. = Yakán (Philip. language)
± = about
& = and
∅ = diameter
♂ = male (flower, etc.)
♀ = female (flower, etc.)
♂, ♀ = bisexual (flower)
(♂) (♀) = dioecious with unisexual flowers
(♂♀) = monoecious with unisexual flowers
(♂♀) = polygamous
(♀♂) = polygamous
∞ = many
> = more than (in size, number, etc.)
< = less than (size, number, etc.)
× 2/5 = 2/5 of natural size
× *montana* = means that the epithet *montana* is that of a hybrid