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about his contribution to neuropterological taxonomy

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Cover picture: *Pornothemis serrata* Krüger, ♂ type. This is the only dragonfly taxon
of whose genus name and species name as well Krüger is the author.

Photographer: © P.D. Szymroszczyk, MIZPAN

The scientific names of Krüger's odonate taxa with annotations about his contribution to neuropterological taxonomy

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Abstract

This paper offers an explanation of each of the 44 scientific names given by Leopold Krüger (1861-1942) to odonate taxa together with that for the names of all the genera into which they are sorted now. But prior to that there is some information about the life and work of this scientist, and in the final part his preferences in odonatological nomenclature are compared with those in the names created by F.M. Brauer and F. Ris and some impressions of his studies on Neuroptera are presented and considerations about his aspirations in his work are given.

Zusammenfassung

Diese Arbeit bietet eine Erklärung der 44 wissenschaftlichen Namen, die Leopold Krüger (1861-1942) an Libellentaxa vergeben hat, zusammen mit der für die Namen derjenigen Genera, zu denen sie gehören. Aber vorher werden Leben und Werk dieses Wissenschaftlers vorgestellt und abschließend die Präferenzen Krügers bei der Namenswahl für Libellenarten mit denen von F.M. Brauer und F. Ris verglichen, Eindrücke über seine neuropterologischen Studien mitgeteilt und Überlegungen darüber, was ihm bei seiner Arbeit wichtig war.

Key words: Odonata, dragonflies, Germany, Poland, history of odonatology, biography, taxonomy, nomenclature, history of neuropterology, Neuroptera

Preface

Since Linnaeus (1758), it has been common practice in zoology to classify animals unambiguously with just two scientific names, one for the genus which it might share with other closely related organisms, one for the species itself.

These names may lack any meaning except labeling the taxon unmistakably as long as they are euphonious; but most authors want their names to have a special meaning, which may refer to appearance, morphology, provenance or distribution, environment or behaviour to support diagnosis, or may be chosen to honour people by eponymy thus giving a clue on personal relations. And Leopold Krüger (1861-1942) (Fig. 1) who was active in Stettin (today's Szczecin) certainly was one of the latter type.

Today authors normally explain what a name should express; but in earlier times that was not customary, whereas scientific names traditionally are taken from Greek or Latin, with

which languages not all scientists are familiar any more. So it seems to be worthwhile to deal with the names Krüger gave to Odonata when around 1900 he described dragonflies from Sumatra.

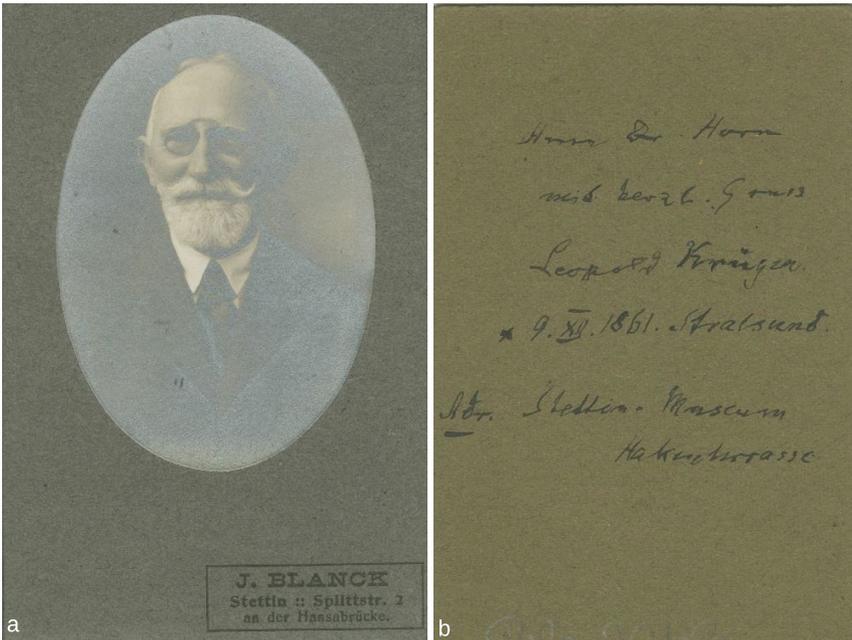


Fig. 1 a. Portrait of Leopold Krüger. **1b.** Krüger's personal dedication to Walther Horn, head of the Deutsches Entomologisches Institut. "Herrn. Dr. Horn | mit herzl(ichem) Grub | Leopold Krüger | * 9. XII. 1861. Stralsund. | Adr(esse) Stettin. Museum | Hakenterrasse [To Dr. Horn with warm greetings. Leopold Krüger * 9. XII. 1861. Stralsund. Address Stettin. Museum Hakenterrasse]". (© SDEI, Münchenberg).

Material and Methods

The names given by Krüger have been extracted from Bridges (1994) and have been checked by means of Paulson & Schorr (2020) to ensure that taxonomic changes since then have been followed up. Their descriptions and those of the genera, into which they are sorted now, have been followed up, the Greek or Latin words on which these are based have been quoted. The probable meaning of the names is explained resorting to the first description if possible, if not, conjectures have been made how they might apply. The names have been arranged in alphabetic order within their respective chapters to facilitate finding their explications. The synonyms are dealt with in a separate chapter, in which the current names are also discussed. But first there is an outlook on life and work of Leopold Krüger and finally his preferences in nomenclature are assessed and, after some remarks on his studies on Neuroptera, an attempt has been made to highlight his aspirations in his work.

Life and work

It is a little difficult to find enough information about Leopold Krüger. There is a short obituary by E. Urbahn (1943) and some information in Meyer (1939) on his connection with the 'Stettiner Entomologischer Verein', which society he served as president during the difficult times of World War I and the following hyperinflation by which the funds of the society were reduced to nothing. About his family and career I received information from the Stadtarchiv Stralsund, where Krüger was born, the archive of the University Greifswald, where he studied, and from the Bibliothek für Bildungsgeschichtliche Forschung Berlin, where his personal file is kept. Among his publications there is an article in the program of his school about the aims of biological education in which something of his personality is to be seen (Krüger 1906); for sources from the internet see p. 62.

Leopold Karl Wilhelm Krüger was born on 9th of December 1861 in Stralsund as the second child to a barber and his wife. His grandfathers had been a skipper and a musician. His parents seem to have wanted him to have a good education, for from the fifth class he attended the 'Realschule 1. Ordnung' in his home town, a school the final exam of which entitled the graduates to study at a university (see below p. 4).

From Krüger 1906 (p. 3) we know that aged 14 he was enthused for nature by a text passage in some publication that said it was like home to us all and that being a stranger to it was embarrassing and detrimental. Later that attitude was increased by understanding nature better by one's own observations: "Und wie lernte ich beobachten! Da gab es kein müßiges Umherschlendern mehr, kein nur genießendes und gedankenloses Wandern, nein, die Natur sprach mit tausend Zungen zu mir, und ich verstand ihre Sprache [And how did I learn to observe! There was no longer leisured sauntering, no just walking joyfully and thoughtlessly, no, nature talked to me with thousands of tongues and I understood its language] ... Der Schulunterricht hatte mir nur dürftige Beschreibungen gegeben; er wurde eher als Nebenunterricht und von Nichtfachleuten erteilt, die weder Liebe noch Wissen und Können in ihn hineintrugen. [The instruction at school had provided me just with scanty descriptions; the lessons were considered to be a minor matter and rather given by non-professionals who exerted neither liking nor knowledge nor competence in teaching]. Endlich aber war in mein halb zweck- und zielloses Herumtasten das helle Licht des Verstehens und Erkennens hineingefallen [Finally however the bright light of understanding and cognition was introduced to my attempts which were partially without purpose and aims]. Es war in den Oberklassen unserer Schule - da erhielt ich durch den berufenen Vertreter des biologischen Unterrichts, teils im Unterricht, vielleicht mehr noch durch seine persönliche Anregung und durch seine Bücher den rechten Hinweis auf alles das, was die Natur belebte. [It was in the upper classes of the school when, by a competent representative of biological instruction partly during classes but perhaps even more by the face-to-face motivation and by his books, I got proper evidence of all the things that enliven nature]. Nun holte ich mit Riesenschritten nach, was mir und meinen Mitschülern der Unterricht früher nicht gegeben hatte [Now I was making up in quantum leaps for what the lessons had not given me and my classmates in the past.]" (Krüger 1906: 4). So probably it is no wonder that after graduation Krüger decided to become a teacher of natural science.

In 1880 he graduated from the secondary school at his home town with good success and enrolled at the University of Greifswald to study natural sciences and mathematics. That university then had about 630 students most of whom were studying medicine. There were just 16 students of mathematics and natural sciences at that time (in the medical education at the university the training in natural science was obligatory in the first semesters, but those who did not want (or were not entitled, see next paragraph) to become doctors had to enrol in the mathematical faculty). Among his academic teachers was the zoologist A. Gerstaecker, the only one of them to whom Krüger later dedicated a dragonfly species (see p. 16).

To understand Krüger's career better the educational system in Prussia at that time has to be outlined roughly: To attend a school was obligatory for at least 8 years. There was the 'Grundschule' (≈ primary school) which every child from the sixth year of life had to attend for four years. After that most children went to the 'Volksschule' (≈ common school) for four or five more years; but there was the 'Mittelschule' (≈ middle school) which in six classes provided a more thorough education intended for more advanced professions like clerks or public officials and which allowed military draftees to serve for but one year (instead of three) and to become sergeants. The highest degree of school education was achieved in the nine years at a 'Gymnasium' or 'Realgymnasium' (also named Realschule 1. Ordnung ≈ Realschule 1st rank), in the former of which the education was centred on ancient Greek and Latin, in the latter Greek was replaced by more instruction in mathematics and natural science. At the end of each of these two educational models was a final exam, the 'Abitur', which qualified the graduates to study at a university or to become an officer when a career in the army was intended. But before 1900 the graduates of a 'Realgymnasium' in (Prussian) universities were only allowed to study mathematics and/or natural science or modern languages. Or else they could attend a 'Technische Hochschule' [institute of technology] (Zott 2007: 84-85). Those who wanted to be a teacher in one of the advanced schools had to complete studies at a university, pass a government examination and complete a period of practice in teaching at the respective type of school as an unpaid volunteer successfully before he could be employed. That means only children of families which were better off could afford such a career, as not only the school and university fees had to be paid, but also the accommodation and the maintenance until qualification was completed.

Krüger finished his studies in March 1883, but his career as a teacher was a little arduous. He took his government exams which were a precondition to be employed as a teacher not until May 1884 in botanics, zoology, and chemistry; in March 1885 he was re-examined in mineralogy, in July 1885 he finally passed an examination by which he was allowed to teach mathematics up to the tenth grade (in the other disciplines his qualification covered also the uppermost 13th grade). According to the government rules he completed his unpaid voluntary service in teaching at a Realgymnasium in Stettin from Michaelmas 1884 to 1885, by which he qualified for being employed and he added another voluntary term until Easter 1886 when the new school year began certainly hoping for an appointment.

But unfortunately in 1879 Prussia's Minister of education in an edict had forbidden that biology was taught in the three uppermost classes, which edict was confirmed by law in 1882 (Zott 2007: 84). That was a reaction to the theories of Darwin and Haeckel, of which the authorities thought that by their alleged materialism they might induce the young to

question the divine right of the monarchy and thus jeopardise law and order. Due to this restriction there were more qualified biology teachers than teaching jobs. So Krüger for two years took a job as a domestic tutor (where and with whom I could not find out), then he was employed for two years at a school in Uetersen west of Hamburg in the province Holstein (linear distance to Stettin 340 km), which Prussia in 1864 had conquered from Danish rule, and for another year at some boarding school (about which I have no information). Finally from Easter 1890 he was employed at a boys 'Mittelschule' at Stettin (then a town of about 100 000 inhabitants and capital of the province of Pomerania) where he stayed until July 1894, when in midterm he was transferred to a position as a 'scientific teacher' at a girls 'Mittelschule' being paid more than double as much as his former salary. This position he held until Easter 1900, when he was transferred to the Friedrich-Wilhelm-Real-Gymnasium as 'Oberlehrer' (≈ senior school teacher) and was given the title 'professor' in January 1906 (then in use not only at universities, but also for scientific teachers at a gymnasium). At that school he stayed for his residual career as a teacher until April 1919, when he became curator at the 'Museum auf der Hakenterrasse' (see p. 8-9) which post he held until his retirement in 1927.

Lebenslauf.

Unterzeichneter, Sohn des verstorbenen Heilgehilfen Theodor Krüger, wurde am 9ten December 1861 zu Stralsund geboren. Er besuchte von Michaelis 1871 an die damalige Realschule I. Ordnung zu Stralsund, welche er Ostern 1880 mit dem Zeugniß der Reife verließ, um sich dem Studium der Naturwissenschaften zu widmen. Seine Studienzeit absolvierte er von Ostern 1880 bis Ostern 1883 in Greifswald.

*Leopold Krüger.
cand. rer. nat.*

Fig. 2. Krüger's curriculum vitae from his examination files: "Lebenslauf [Unterzeichneter, Sohn des verstorbenen Heilgehilfen Theodor]Krüger, wurde am 9ten December[1861 zu Stralsund geboren. Er besuchte von Michaelis 1871 an die [damalige Realschule I. Ordnung zu Stralsund, welche er Ostern]1880 mit dem Zeugniß der Reife | verließ, um sich dem Studium || der Naturwissenschaften zu wid-|men. Seine Studienzeit absol-|vierte er von Ostern 1880 bis |Ostern 1883 in Greifswald.| Leopold Krüger.| cand. rer. nat. [Curriculum vitae. The undersigned, son of the late doctor's assistant Theodor Krüger, was born on the 9th of December 1861 at Stralsund. From Michaelmas 1871 he attended the then named 'Realschule 1st rank' at Stralsund, which he left at Easter 1880 with the certificate of maturity to devote himself to the study of natural science. He completed his studies in the time from Easter 1880 to Easter 1883 at Greifswald. Leopold Krüger. cand(idatus) rer(um) nat(uralium).]" (© University archives Greifswald).

About his private life there is very little information. When he sat his exam (Fig. 2) his father already was dead. So in the year between the end of his studies and the examination he might have been occupied at home in family business. Only after his regular employment in 1890, that means after a reliable income was secured, in May 1891 he married his wife Anna, née von Normann, at Stralsund. Her father – already dead then – had been a judicial officer at Franzburg, a town from where the surroundings of Stralsund were administered. That means: Krüger's academic career had enabled him to marry into an aristocratic family. From his personal file we can see that he and his wife had a daughter, but about both I could not find any further information (a widow Anna Krüger is mentioned in the street directory of Stettin in 1944 in the same street, in which Leopold was listed in 1942, but not at the same address, and Krüger is a very common name, so that one cannot be sure about her identity).

We will now have a look at the 'Stettiner Entomologischer Verein' (cf. Anonymous 1938; Meyer 1939; Wilfert & al. 2016; Zessin 2018), because Krüger's life was closely connected with that society at least from 1899 when he became a member (Stettiner entomologische Zeitung 60: 254).

That society had been founded in 1837 as the third Entomological Society in the world after those of Paris and London, the capitals of their countries, in a provincial town with less than 40 000 inhabitants. But after difficult first years this foundation became a success, especially because of the journal of the society, the 'Entomologische Zeitung' (from 1911 'Stettiner Entomologische Zeitung') which was the first entomological journal in Germany that lasted more than a few years. At its zenith in 1876 the society had 677 members from over the world, most of which were from German states. But then probably due to the attractiveness of the 'Deutsche Entomologische Gesellschaft' at Berlin (founded in 1860) with its journal 'Entomologische Zeitschrift' it began to shrink. In 1892, when the last list of the society was published, it had ca 500 members. Much of its success was due to the second and the third president, Carl August Dohrn (1806-1892), who presided from 1843 to 1887, and his son Heinrich Dohrn (1838-1913), who was president from 1887 to his death, because they were economically independent (the family owned among others a large sugar refinery) and did not need to exercise a profession. So they could expend much time and energy in the issues of the society. Carl August, who was also well connected politically and to other outstanding people like the musician Felix Mendelssohn and the explorer Alexander von Humboldt, used to travel every year to other parts of Europe, where he contacted universities and zoological institutes and exchanged entomological material. His son Heinrich donated his father's (and later also his own) entomological collections to the township of Stettin as he was aware that many great collections after the death of the collector had deteriorated due to neglect. Heinrich, who had been vice president from 1867, engaged himself in the political sphere: he was an unpaid member of the administration of the town, among others for horticulture and public parks, from 1874 he was a member of the 'Reichstag' (the German parliament after the foundation of the 'Reich' by consent of the rulers of the particular states in 1871), he engaged in the foundation and erection of a municipal museum (also by large financial contributions and by motivating other well off citizens to contribute as well), in which objects concerning culture, regional history and natural history and a scientific library should be presented to the public. This was opened in 1913. Earlier (from 1892) he made his own collections and that of the 'Entomologischer Verein' to-

gether with its library accessible to the public in his own home. For some time he owned a tobacco plantation at Sukaranda, Sumatra, in the north eastern province Deli (Fig. 3) which he visited in the years 1893-1897 three times. On these journeys he employed a preparator to have the animals which he collected and acquired during these journeys brought home in best condition. Of the insects from there he described the Orthoptera and some of the Macrolepidoptera himself, other orders were commissioned to several specialists. Most of the entomological findings were published in the following volumes of the 'Entomologische Zeitung'.



Fig. 3. Clearing jungle for a plantation in Sukaranda (Deli province, Sumatra), Carl J. Kleingrothe, c. 1885 – 1900. From the 'Sumatra Album' of Paul and Lucie Sandel. (In the public domain; file provided by the Rijksmuseum Amsterdam)

From Krüger 1913d: 34 we know that from 1896 he was entrusted with the care of H. Dohrn's collections of Odonata and Neuroptera, that means when Dohrn needed assistance with the scientific exploitation of the large material, and with the publication of new taxa. That task was the basis for Krüger's scientific success.

This is the place to have a look at an episode from Krüger's life: In 1898 it was feared that the San Jose scale (*Comstockaspis perniciososa*), an insect extremely noxious to pomiculture, which had been described in 1880 by Henry Comstock after great damage to orchards in California and later also in the eastern States of the US, might have been transferred to Germany (cf. Wilfert & al. 2016: 179). Therefore the 'Stettiner Gartenbau-Verein' (= Stettin association for horticulture) announced a competition for the best treatise about three questions: 1 Whether there ever had been migrations of insects between the United States and Germany? 2 Whether these immigrations might have resulted in acclimatisation? 3 What economical effects did that have?

The price money had been donated by Heinrich Dohrn (see above). The only paper submitted was by Krüger. The judging panel were A.B. Frank, professor for plant physiology at the agricultural college Berlin and director of the department of agriculture and forestry at the 'Kaiserliches Gesundheitsamt' (≈ Imperial Health Office), who with others in 1898 edited a treatise informing about the San Jose scale (Frank et al. 1898), the zoologist F. Karsch (see p. 26) and P. Sorauer, also a specialist in plant pathology, who then lived in Berlin as a private scholar. Krüger's conclusions were that the differences of climate between Northern America and Central Europe were too wide to allow insects to acclimate and that it was not sure that e.g. *Phylloxera vastatrix* really originated from North America and had caused the vast damage to European viniculture that had taken place in the late 19th century. That means his results are not in accord with modern scientific knowledge. So a controversy arose among the judges: Frank opposed Krüger's results, but was outvoted by the other two. So Krüger's paper was accepted and printed at the expense of the 'Stettiner entomologischer Verein' in 1899(c). But each party of the panel advanced its view in own papers (cf. Krüger 1900) and finally Heinrich Dohrn (1900) defended Krüger's treatise in the 'Stettiner Entomologische Zeitung' (see Jansen 2003: 226).

One might assume that the close relation to H. Dohrn made a change in Krüger's life: In spring 1900 he was appointed to a post at a school where his qualification for the uppermost classes was put to account (cf. p. 5). In 1906 he was entrusted with the task of writing about the function and aims of biological instruction at school in that year's program of his school, which was a privilege as such a program was a kind of figurehead and thought to contribute to the reputation of the school. Already in November 1900, one year after he had joined the society, he had been elected vice president and secretary of the 'Stettiner entomologischer Verein'. In the latter function in 1913 he had to write the festschrift for the opening of the new museum to which the society and its president had so much contributed, also by its collections and its library. After Heinrich Dohrn's death in October 1913, for whom he also authored an obituary (1913e), Krüger became head of the society. Less than a year later World War I (1914-1918) broke out. The custodian of the Stettiner Museum, Günther Enderlein (1872-1968), joined the army as a volunteer and next year its conservator Edmund Schmidt was conscripted; so Krüger tried to fill that gap taking care of the natural history section of the museum alongside to his professional duties and the presidency of the 'Entomologischer Verein'.

In 1918 in addition to his other duties he took part in the foundation of the 'Pommersche naturforschende Gesellschaft' (≈ Pomeranian Society for the Study of Natural History) which one might call an institution to promote citizen science in natural history, as one of its aims was to produce a reliable registration of the Pomeranian fauna (cf. Meyer 1939: 56; Pfaffl 2017). It was initiated by the head of the municipal school department at Stettin who also became its president. Ca 90 % of its members were teachers. Krüger was chosen as its vice president and acted as the editor of its journal (first edition 1920), which functions he exercised until his retirement in 1927.

In 1919 a new change in his career came about; he was transferred from his school, in which he had taught for nearly two decades, to the post of a curator at the museum, the department for natural history of which he had administrated as a volunteer already (Fig. 4). For the 'Stettiner entomologischer Verein' a very difficult period began due to monetary devaluation, by which the society's fund was reduced to nothing and the cost for the

production of the 'Entomologische Zeitung' was increased dramatically. In spite of these difficulties Krüger managed to maintain the publication of the journal (albeit for three years with reduced volume) and the society by financial support secured by contract from the city of Stettin; but in return the library of the society became property of the municipality and the 'Stettiner Entomologischer Verein' had to join the 'Pommersche naturforschende Gesellschaft' as an autonomous subsection in 1922. Both journals were to be continued (see Meyer 1939: 57; Wilfert & al. 2016: 181), which task was handled by Krüger until his retirement. In 1927 in spring he had to leave his post at the museum because of having reached the age limit, and in the fall of that year in the general meeting of the societies he resigned from all his functions he had exercised so far.

In 1937 at the 100th anniversary celebration of the society its current president A. Kästner [1901-1971; later known by his "Lehrbuch der speziellen Zoologie" (= Manual of special Zoology) in two volumes] in his description of Krüger's presidency not only emphasised his merits about its recovery in difficult circumstances but also that he had made sure that by



Fig. 4. The 'Hakenterrasse' before World War II; the museum is the first building on the left hand side. Both were planned and erected by the City Planning Officer Wilhelm Meyer in place of an abandoned fort. Its name refers to the town mayor Hermann Haken (1828-1916) who had promoted this project. Meyer later succeeded Krüger as president of the 'Stettiner entomologischer Verein' (Photo received from Mrs E. Jurska, Muzeum Narodowe w Szczecinie; in the public domain).

regular lectures also those were supported in their knowledge who had not been privileged to study natural science (Anonymous 1938: 316).

About Krüger's last years I could not find anything except this remark in the obituary (Urbahn 1943): "Professor Krügers Amtsführung im Ent{omologischen} Verein unter so schwie-

rigen Umständen ist nicht reibungslos vorübergegangen, und als er gar wegen Erreichung der Altersgrenze 1927 in den Ruhestand treten mußte, zog er sich gekränkt aus seinem bisherigen Arbeitskreis zurück. Er hat das Museum nie wieder betreten trotz aller Bemühungen des neuen Vereinsvorstandes, der ihn durch Verleihung der Ehrenmitgliedschaft und auf jede andere Weise zu erfreuen und für das Vereinsleben wiederzugewinnen suchte. Still und fast unbemerkt ist dann Professor Krüger am 6. September 1942 verschieden [Professor Krüger's administration of the Entomological Society in those difficult circumstances did not pass without friction, and when because of reaching the age limit he had to retire, he took offense and withdrew from his former activities. He never entered the museum again in spite of all efforts of the new steering committee of the society, which tried to please him by conveying an honorary membership {in 1928} and by any other means to win him back to engage in the activities of the society again. Peacefully and nearly unnoticed professor Krüger passed away on September 6th 1942]."

We will now have to look at Krüger's publications. His treatises on insect migration between continents (1899c, see p. 7-8), on the aims of biological instruction (1906, see p. 8), on the foundation of the Stettin Museum and his obituary for H. Dohrn (1913d+e, see p. 8) have already been mentioned. So his other papers will be treated here.

His first subject were the Odonata from Sumatra which Heinrich Dohrn had brought from there with additional specimens from other parts of the Indonesian region, which were dealt with in the order damselflies (1898; called agrionids there), aeshnids and gomphids (1899a), corduliids (1899b), libellulids (1902a+b), from which Krüger selected the genus *Neurothemis* for a taxonomical revision (1903). These studies were based just on the Stettin collection and the library of the entomological society. Occasionally in the papers on dragonflies we learn that Krüger in single cases also had been advised by McLachlan (Krüger 1898a: 288+321) or Martin (Krüger 1902b; 1903: 263). That means: Krüger did not draw upon the collections of the universities at Greifswald or Berlin which could have provided additional material. Probably the authorities there had not been prepared to entrust a novice without a title or any prior publication with their precious material and due to his duties Krüger had not been able to attend those collections for a study visit. The scientific names from these five publications are the main subject of this paper.

Having completed the Odonata from Dohrn's collection there remained the Neuroptera, the examination of which Krüger had been committed to. This order was not as well investigated as the Odonata and therefore he could not publish his first results before 1912. In that paper he attended to the genus *Osmylus* and its sole representative in Central Europe, *Osmylus fulvicephalus* (Scopoli, 1763), which species, following his teacher Gerstaecker, he named *Osmylus chrysoptera* (Linnaeus). In the first 24 pages he gives a lengthy description of the vagaries of (mis)identifications and classification of the species up to his time, adding a reference list of 94 titles, then he evaluates the former descriptions (8 pp.), finally adding a description of his own in 16 pages, of which 10 refer to the wings and their venation. In this paper nowhere is any figure found by which the characteristics might be clarified better than by many words. By this we can see Krüger's meticulous method of operation; first the history, then a discussion, finally his own conclusions. His assessment of his results might be seen from the heading of this and the following papers: "Beiträge zu einer Monographie der Neuropterenfamilie der Osmyliden [Contributions to a monograph of Osmylidae, family of the Neuroptera]." That means he aimed to give a summary of this family on

a world wide scale, not a regional recording as in his dragonfly publications. For this task he had been provided with the specimens of the university collections at Berlin and Greifswald and later also those from Vienna, in addition the Neuroptera included in amber from the Museum at Danzig (today's Gdansk). From this basis his later publications on Osmylidae followed to appear (Krüger 1913a, b, c, 1914, 1915b), supplemented with information given by the Danish neuropterologist P. Esben-Petersen (1869-1942; for him see Beolens 2018: 328) and the Japanese entomologist (and cancer researcher) Waro Nakahara (1896-1976).

What Krüger achieved in the taxonomy of the Osmylidae might be seen from these numbers: Of the nine subfamilies, into which they are now divided (Winterton & al. 2019: 6) six trace back to Krüger, four directly (Porisminae, Protosmylinae, Stenosmylinae, Spilosmylinae), two indirectly (the Eidoporisminae by Esben-Petersen (1917: 3) are credited to "Krüger in litt."; the Kempyninae Carpenter, 1943 resume the Kalosmylinae based by Krüger on his genus *Kalosmylus*, which as a younger synonym of the genus *Kempyna* (Navas, 1913) could not be maintained).

Into his description of the Osmylidae five genera established so far were included (he assessed the genus *Gumilla* Navas, 1912 as not pertaining to that family (1915b: 65) and the genus *Osmylidia* Cockerell, 1908 escaped his notice). To these Krüger added 23 others, which often were based on just one species, which for their part in several cases were described from a single specimen. Of these just nine are still valid; the others are mostly seen as synonyms either of the taxa from which Krüger wanted to separate them or of one of his own new genera. These classifications depended on Krüger's theory of the development of wing venation with finest distinctions (cf. p. 44-45). Ten new species were introduced by him (see Winterton & al. 2019). So apart from Krüger's competence to recognise nearer relationships there also was an ability to see slightest differences which however he overrated in his taxonomic efforts.

In the course of these studies Krüger saw the necessity to define what to understand under Neuroptera. So again he gave an elaborate historical outline in two parts (Krüger 1915a, 1917), in the second of which he defined them as holometabolous insects to be restricted according to the treatises of Brauer's pupil A. Handlirsch. Some of their families he treated in other papers in the next years depending on how much material he had from them (1916 Myrmeleontidae; 1922a Psychopsidae; 1922b Berothidae; 1922c Hemerobiidae; 1923a Sisyridae) and finally he gave a review of the Neuroptera found in amber from the collection at the Danzig Museum (1923b). In Krüger 1923a: 64 he promised: "Alle Nachträge zu den Psychopsiden, Berothiden, Hemerobiiden und Sisyriden werde ich später in einer besonderen Arbeit veröffentlichen. Es sind von mir auch anscheinend Gattungen aufgestellt, die schon von anderen Autoren veröffentlicht sind. Einige neue Gattungen werden folgen [All addenda to the Psychopsidae, Berothidae, Hemerobiidae und Sisyridae I will publish later in a special paper. It seems that also genera are erected by me had already been established by other authors. Some new genera will follow]". This promise however never was fulfilled as far as I see. The last publication by Krüger in the 'Stettiner Entomologische Zeitschrift' was an obituary for Gustav Schroeder (1854-1931), who had been a member of the entomological society's steering committee from 1899 to his death, which means longer than all the time of Krüger's membership on that board and presidency (Krüger 1931).

It is now the place to deal with Krüger's publications in the 'Abhandlungen und Berichte der pommerschen naturforschenden Gesellschaft' (cf. above p. 8).

In the first two volumes (1920 & 1921) Krüger explained the importance of a reliable regional fauna of the Pomeranian province (1920a), asked for contributions from the members to a listing of the mammal fauna (1920b) [in this context is also to be seen a short note about the occurrence of the European badger (*Meles meles*) about ten kilometers south east of Stettin (Krüger & Richter 1920), the only publication shared by Krüger with another author], then he gave a historical survey of its development (1920c) and of what was known about it from sources from the 19th century (1921a). That means: next to birds the regional occurrence of which was already well investigated, the mammals form the easiest group to get information about, and it was one aim to have them adequately represented in the Stettin Museum. So this was Krüger's first concern after he had become curator of the museum. But already in the first volume of the journal he resorted to entomology: in the short notes he presented the genera *Osmylus* and *Myrmeleon* as the most spectacular local Neuroptera (1920d) – another short note on *Myrmeleon* followed in 1921b – and he asked for Odonata and Neuroptera to be sent for classification (1920e). So already then he sought to be able to write in regional context about the insect order which he had named his "heimliche Liebe [secret love]" earlier (1906: 3). But before that publication he authored further short notes which listed several insect groups from Pomerania (Macrolepidoptera 1925a; sawflies 1925b; bees and wasps 1925c).

His regional dragonfly publication came about in the sixth volume of the journal (1925d). As the basis of his studies he mentions the regional part of the Stettin Odonata collection, the main part of which was brought together, after he had been entrusted with it by Dohrn, "von mir und meinen Wandergefährten aus der weiteren Umgebung Stettins [by me and my companions in hiking from the surroundings of Stettin]" (p. 89). Also other contributors are mentioned. In his treatise Krüger first informs about the history of the attribution of the odonates to various orders before they were recognised as an order of its own right, about their classification according to wing venation by the system of Comstock-Needham; then after mentioning the qualities of the presentation of Odonata in Ris 1909b and of the enthused description of their behaviour in nature by the German poet Hermann Löns he gives a list of the families with their genera characterised mainly by wing venation. After that follows a survey of the Pomeranian odonate fauna with separate tables of the particular families with their genera and species and their respective occurrence in Belgium, the Netherlands, Hanover, Mecklenburg, Pomerania west and east of the river Oder, and the countries around the Baltic sea. But in this paper there neither is a key which would allow identifying the single species nor a single figure, whereas Krüger praises their quality in Ris 1909b. Also a list of references is missing and no phenological data are given, as Krüger does not see them to be important due to the alleged longevity of the imagines and the changes according to the influence of weather conditions. One reason for this deficiency probably is this: "Weitere Betrachtungen (über das märkisch-sächsische Gebiet, die Mittelgebirge, die Karpathen und Alpen) sollen einer späteren Fortsetzung vorbehalten bleiben [Further implementation (about the Brandenburgian-Saxonian region, the low-mountain-range, the Carpathians and the Alps) shall be reserved for a later continuation]. Eine Literatur-Übersicht soll ebenfalls später folgen [Also a list of references is to follow later]" (p. 106). That means Krüger considered this publication to be a

preliminary work for a treatise that never was completed. So this last paper on dragonflies by him has its merits, but leaves a lot to be desired.

After this publication there is nothing but a second short note on Macrolepidoptera (1925e). From his publications in this very journal one may see Krüger's aspiration to help with information to motivate others to acquire a better knowledge of nature, as in his publications in the *Stettiner Entomologische Zeitung* it was his aim to enlarge the cognition of what he thought to be the system of neuropterous entomology based on his insights in its course of development.

Krüger's taxa

(Underlined vowels bear the accent)

acutimargo ssp. [*Copera vittata* 1898: 103]

L. acutus –a –um = sharpened, pointed, sharp, cutting + margo = an edge, brink, border, margin

The name refers to the rear margin of the prothorax: "er ist zunächst wie bei *marginipes*, aber die Seitenecken des umgeschlagenen Mittellappens laufen constant je in eine dunkle, schräg nach vorn, seitwärts, halb nach oben gerichtete, mittellange Spitze mit breiter Basis aus [it is initially like that of *marginipes*, but the lateral corners of the median lobe invariably each end in a dark point of mediocre length with a broad base obliquely directed forward laterally, halfway turned upward]."

Krüger is not sure if his new taxon eventually might turn out to be *C. imbricata* (see p. 27 s.v. *lobimargo*) or *vittata* (L. = bound with a fillet, wreathed, probably due to a yellow traverse band between the eyes through the ocelli and another one at the back side of the occiput), of which it is now considered to be a subspecies (see Steinmann 1/1997: 391). But Dow et al. (2018: 9-10) state about the taxonomic status of *acutimargo*: "This taxon, endemic to Sumatra and which has generally been treated as a subspecies of *C. vittata* for most of the last one hundred years, is distinct morphologically, and appears to exhibit variation in its markings outside of that seen in the rest of the *vittata*-complex."

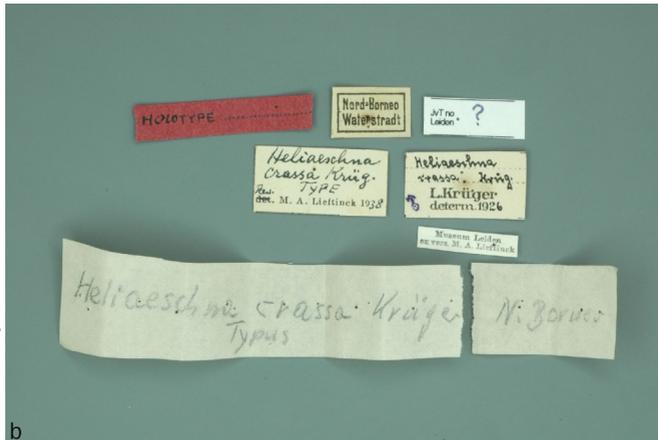
crassa [*Heliaeschna* 1899a: 325] (Fig. 5)

L. crassus –a –um = solid, thick, fat, gross, stout

Krüger first mentions that his new species is rather similar to the species *H. simplicia* (Karsch, 1891: 282) {the name is derived from *L. simplex* = simple, single, but the grammatical form (which would be neuter plural) seems to be misapplied to show an ending perceived as feminine singular, for the form of *simplex* in nominative singular is the same in all three genders. The name probably refers to the fact that there is only a single row of cells between the two sectors of the triangle in the hindwing. A similar grammatically improper use is found in Kirk 1897: 497 for a genus of Poaceae which is one-flowered}. But then Krüger points to differences of his new species: "Der ganze Körper ist massiger. Der Kopf ist größer, 10 mm breit (*simplicia* 9 mm nach den hiesigen Stücken) [On the whole the body is bulkier, the head is larger, 10 mm in breadth (*simplicia* 9 mm according to the specimens at hand)]."



a



b

Fig. 5a. *Heliaeschna crassa*, holotype ♂; **b.** labels. Two other specimens of Krüger's type series are still at MIZPAN (© Naturalis Biodiversity Center Leiden)

dohrni

[*Gynacantha* 1899a: 278/285-287]

This species is dedicated to Heinrich Dohrn (1839-1913) who had commissioned Krüger to describe his Odonata collection from Sumatra (see p. 7). One of Krüger's specimens was from Sukaranda by Dohrn, but there were also specimens from Java (1 ♂) and Northern Borneo (3 ♂ 2 ♀) in the Stettin collection).

dohrni

[[*Risiophlebia*] 1902a: 186]

This taxon was based on six specimens collected by Heinrich Dohrn (see p. 6-8): "Heimath. Nur Sumatra: Soekaranda (Dohrn) [Country. Only Sumatra: Sukaranda (Dohrn)]" (p. 187; a picture of the species by A.G. Orr is found in Hämäläinen 2016: 33).

farinosa [Brachydiplax 1902a: 135] (Fig. 6)

L. *farinosus* –a –um = of meal, mealy

The name refers to the pruinosity of the males: "Der Thorax ist bei ♂ und ♀ durchaus grün metallisch, beim ♂ außerdem blau bestäubt, wie auch die ersten Abdominalringe [The thorax of the ♂ and ♀ is green metallic throughout, in the ♂ also blue pruinose as are the first abdominal segments]"(p. 136).



Fig. 6. *Brachydiplax farinosa* ♂, 30.07.2011, Khao Lak, Thailand. The photo agrees well with Krüger's description of the species (© Jürgen Ruddek)

fumata ssp [Macromia moorei 1899b: 333]

L. *fumus* = smoke, steam, fume + –atus –a –um = equipped with, marked with

The taxon is described by Krüger as a species, but later was classified as a subspecies of *M. moorei* Selys, 1874 [named after the director of the East India Company Museum at London, Frederick Moore (1830-1907), see Beolens 2018: 296]. In his description Krüger however stated: "Ich halte die vorliegenden Exemplare vorläufig für eine neue Art, die allerdings Moorei äußerst nahe steht, besonders durch die Bildung des 10. Segments des ♂, und die vielleicht nur als eine Varietät derselben zu betrachten ist. Es bestärkt mich darin die völlig verschiedene Heimath beider Arten. Heimath. Nur Java [For the time being I take my specimens to be a new species which however is very near to *moorei*, especially by the shape of the 10th segment of the ♂ and perhaps it only should be considered to be variety of that. In this {assessment} I feel confirmed by the totally different provenance of both species. Country: nowhere but Java {*moorei* was then known from the Himalaya and Bengal}]" (p. 335). The name of his taxon is evoked by this feature: "Die Flügel sind hyalin, aber angeräuchert [The wings are hyaline, but somewhat smoky]."

gerstaeckeri [*Macromia* 1899b: 335]

This is one of the very few species for which Krüger informs us after whom it is named: "Ich habe diese Art nach meinem verstorbenen Lehrer Prof. Dr. Gerstaecker genannt [I have named this species after my late teacher professor Dr. Gerstaecker]" (p. 338). Carl Eduard Adolph Gerstäcker (1828-1895) after having studied medicine and natural science at Berlin was employed at the Zoologisches Museum Berlin and in 1856 became Curator of the entomological department. From 1864 he taught Zoology at the Agricultural Institute, becoming professor in 1874. In 1876 he accepted a vocation to a chair of zoology at the University of Greifswald which he held until his death. Many of his publications refer to arthropods, of these two about insects from the German colonies in Eastern Africa, others about noxious insects like Colorado potato beetle, phyloxera and migratory locusts (for more see Uschmann 1964; Beolens 2018: 151).

gracilis [*Amphicnemis* 1898: 121]

L. *gracilis* –is –e = thin, slight, slender, slim, meagre, lean

For this species Krüger states: "Sehr zart gebaut [Built very delicately]."

gracilis [*Heliogomphus*] 1899a: 302]

L. *gracilis* –is –e = thin, slight, slender, slim, meagre, lean

In the description of the species it reads on p.304: "Abdomen lang und dünn [Abdomen long and thin]."

hageni [*Rhinocypha* 1898: 135] (Fig. 7)

There is no information about the eponym or the reason for the dedication in Krüger's description, but there cannot be any doubt that it is named after Hermann August Hagen (1817-1893), who was among the most outstanding entomologists of the 19th century. Hagen had concerned himself with Odonata already as a teenager. After he had completed the final examinations at school he attended the university of his native town Königsberg (now Kaliningrad) to study medicine, but aside from that he focused on entomology. He achieved his medical doctorate with the first odonatological dissertation which was a synonymy of the European Odonata. By this publication he came in contact with E. de Selys Longchamps, the 'Father of Odonatology' with whom he was in close cooperation until his death. He practised medicine in his home town hoping for a long time for a post at one of the major entomological collections in Germany, but in vain. So in 1867 he accepted a vocation to the Museum of Comparative Zoology at Harvard where in 1870 was appointed the first professor of entomology in the United States. There he stayed until his death except one journey to Europe (for more see Beolens 2018: 169-170; Fliedner & Endersby 2019: 43-44). The dedication to Hagen might have been prompted by the fact that one of the two *Rhinocypha* species known from Sumatra before had been described by Hagen.

kirbyi [*Gynacantha* 1899a: 278/319]

Also in this case Krüger does not explain to whom or why he dedicated this species from New Guinea. But certainly it refers to William Forsell Kirby (1844-1912) who in 1890 had published 'A Synonymic Catalogue of Odonata' summing up the known taxa around the world and by this rendered a notable contribution to the odonate taxonomy in ad-

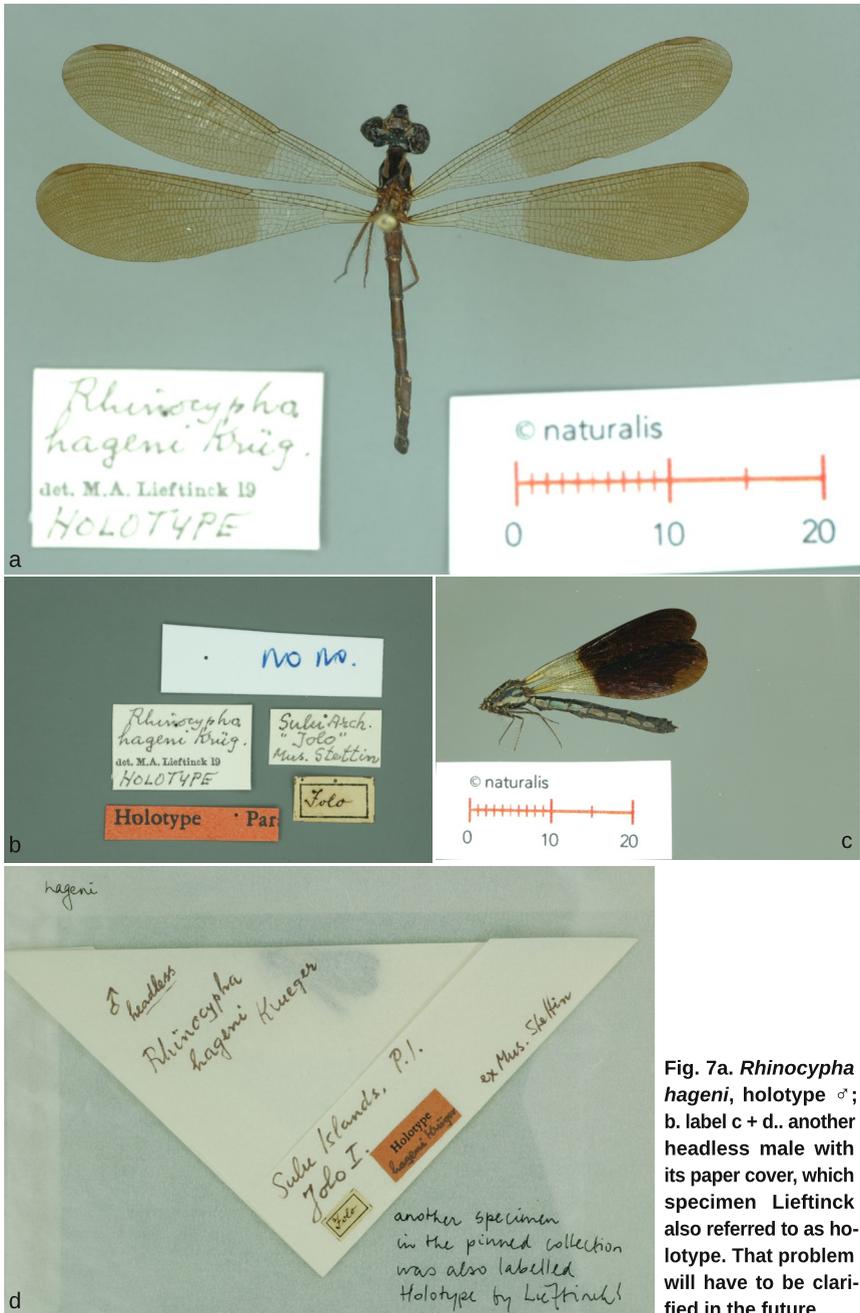


Fig. 7a. *Rhinocypha hageni*, holotype ♂; b. label c + d.. another headless male with its paper cover, which specimen Liefstink also referred to as holotype. That problem will have to be clarified in the future

dition to his other merits especially to the classification of libellulids (1889a). Already as a teenager Kirby was a skilled entomologist and in 1861 was elected fellow of the Entomological Society of London; in later years he was secretary of that society for more than 20 years. In 1867 Kirby became Assistant Naturalist in the Museum of the Royal Dublin Society, which post he left in 1879 due to a vocation as curator at the British Museum of Natural History at London, where he stayed until retirement in 1907. Kirby had many interests besides entomology and published also on natural history, botany, evolution, mythology, folklore and translated the national poem Kalevala from Finnish to English (for more about him see Endersby & Fliedner 2015: 57-58; Beolens 2018: 220-221).

intermedia ssp [Euphaea variegata 1898: 76]

L. *intermedius* –a –um = that is between, intermediate

After having given a first description of the female of *E. aspasia* Selys (named after the second wife of Pericles, the Milesian rhetorician and philosopher Aspasia, who by some sources was said to have been a courtesan; so certainly it is an odonate name pertaining to a charming female being from antiquity) Krüger deals with three specimens from Sukaranda (Deli province, Sumatra): “Drei sehr interessante Thiere. Sie stimmen in ihren Merkmalen theils mit *variegata*, theils mit *aspasia* überein [Three very interesting animals. In their characteristics in part they agree with *variegata*, in part with *aspasia*].” So he concludes: “Sollte diese Form als neue Art zu betrachten sein, so wäre dafür die Bezeichnung *Euphaea intermedia* n. sp. zu nehmen [If this taxon has to be classified as a new species, the name *Euphaea intermedia* n. sp. should be adopted]” (p. 77). Rambur’s species name *variegata* [L. = varicoloured, variegated] probably refers to this feature of the males (he did not have any female specimen): “alis ... posticis macula magna supra viridi-aenea, subtus pulchre violacea [the hind wings with a large spot, above being green metallic, below of a pretty violet].”



Fig. 8: *Euphaea lara* ♂, 07.1991, Mangku Saki, Lombok, Indonesien. This is the only species Krüger named with a name from classical antiquity (© Jürgen Ruddek)

lara

[*Euphaea* 1898: 131] (Fig. 8)

L. *Lara* = daughter of the river-god Almo, a nymph whose tongue was cut out by Jupiter on account of her talkativeness (she had informed his wife Juno about one of his love affairs), and who was worshipped in Rome under the name of Tacita or Muta [= the Silent or the Mute], as the Augustean Roman poet Ovid tells in his *Fasti*.

This is another damselfly name from antiquity referring to a pretty female being.

maclachlani

[*Gynacantha* 1899a: 278/319]

Whereas Krüger does not mention it explicitly the species was named after Robert McLachlan (1837-1904) who was one of the leading British odonatologists of his time (for more see Beolens 2018: 282-283). From Krüger 1899a p. 288 (s.v. *G. degorsi*) and p. 322 (s.v. *Tetracantagyna vittata*) we know, that there had been a correspondence with McLachlan about the identification of several species of *Gynacantha*. So we can conclude that Krüger named the new *Gynacantha* species, which had been collected by J. Waterstradt in Borneo, in gratitude for this support in classification.

***martini* ssp**

[*Neurothemis ramburii* 1903: 263]

This is one of Krüger's taxa the eponym of which is explicitly named in the publication: "Nach Abschluß meiner Arbeit erhielt ich durch die Liebenswürdigkeit von Herrn René Martin 1 *Neurothemis* ♂ von den Key-Inseln, welches er mit *disparilis*? bezeichnet hatte [After having finished my publication {Krüger 1902a} I received by the kindness of Mr. René Martin one ♂ of *Neurothemis* from the Kai Islands which he had tagged as *disparilis*?]". About this specimen Krüger was very glad because in it he saw a confirmation of his theory on the evolution of the genus. So he continues: "Ich statue Herrn René Martin meinen Dank ab, indem ich diese wissenschaftlich bedeutende Art nach ihm benenne [I express my gratitude to Mr. René Martin by naming this new species after him]". Ris (1911: 557) classified Krüger's taxon as a subspecies of *N. palliata*, while Davies & Tobin (2/1985: 117) assigned it to *N. ramburii* (for more about the taxon see Seehausen & Dow 2016: 66-68). René Martin (1846-1924) was the leading French odonatologist of his time. He had studied law in Paris (1866-1870) and practised as a solicitor at Le Blanc (Dép. Indre). But at the same time he organised a net of correspondents around the world with whom he exchanged odonate specimens. Thus he built up a very large collection (for his contributions to the "Krüger Collection" see p. 50). He was in contact with Selys, after whose death he compiled the catalogues of the Selys collection for the Cordulines, Aeshnines and the Calopterygines, the last of which was never printed due to the lack of paper during World War I. His last years he spent with his daughter in Chile (for more see Beolens 2018: 275; Fliedner & Endersby 2019: 53).

parvus

[[*Euthygomphus*] 1899a: 308]

L. *parvus* –a –um = little, small

This is indeed a rather small gomphid: "♂. Abdomen ohne [without] App. 27 mm, ... ♀. Abdomen 29.5 mm." (A ♂ specimen reared from the larva by Liefinck (1941: 235) was even smaller).

selysi

[*Rhinocypha* 1898: 81]

There is neither information, why the species was named after the 'Father of Odonato-

logy' nor whether Krüger was in letter contact with him before the publication (but see Krüger 1901: 127). So this is just another species that was named after one of the outstanding experts in odonatology by Krüger. The Belgian naturalist and politician baron Michel Edmond de Selys Longchamps [1813-1900] already in his youth had developed an interest in nature and by and by had focused on Odonata of which he had gathered the largest collection of his time and for which order he had generated a systematic classification based on wing venation. In this task he was helped by H.A. Hagen (see p. 16), with whom he was in contact all the time from 1842 (for more see Wasscher & Dumont 2013; Beolens 2018: 377-379).

serrata [*Pornothemis* 1902a: 163]

L. *serratus* –a –um = sawshaped, serrated

The name refers to the femora: "Beine schwarz, Schenkel unten sägeartig, Schienen mit etwa 10 Dornen [Legs black, femora serrated below, tibiae with ca 10 spines]" cf. fig. 15a p. 39). Dow & al. 2019: 24-25 state that in the Bintulu Division of Sarawak they have found two (if not three) different species which were treated as *P. serrata* Krüger so far. So there will soon a new species of that genus be described.

sumatranus [(*Megalogomphus*) 1899a: 294] (Fig. 9)

L. *Sumatranus* –a –um = from Sumatra

This species was described from a single male specimen: "Heimath. Nur Sumatra: Soekaranda (Dohrn) [Country: Sumatra only, Sukaranda only (Dohrn)]." According to Lieftinck 1954: 96 the species is distributed in Siam, Malaya, Sumatra and Borneo, but a recent study (Dow & Price 2020) has shown that specimens from Borneo pertain to distinct species, *M. buddi* n.sp. and *M. borneensis* (earlier classified as *M. icterops borneensis* Laidlaw).

sundana [(*Drepanosticta*) 1898: 107]

L. *Sundanus* –a –um = from the Sunda region (cf. p. 40-41)

In his description Krüger first justifies why he assesses that his two males from Java and the female from Sukaranda pertain to one species, that differs from the nearly related *D. halterata* (Brauer) of which only males are known. So a toponym that includes the provenance of both sexes seems appropriate: "Die Aufstellung einer neuen Art: *sundana* erscheint somit gerechtfertigt. Zu ihr gehören die beiden ♂ von Java und das ♀ von Sumatra [Thus the erection of a new species: *sundana* seems to be justified. The two ♂ from Java and the ♀ from Sumatra belong to it]."

tricolor [(*Rhinagrion*) 1898: 136]

L. *tricolor* = three-coloured

Krüger does not explain his choice of name for this rare Javan species. It probably refers to the coloration of the male's abdomen the first four segments of which are described as blackish brown to black with a broad light blue rear margin, the segments five to nine as shining reddish brown with a black rear margin (head and thorax are black with yellow markings).



Fig. 9. *Megalogramphus sumatranus*, holotype male a. dorsal view b. lateral view. c. labels. (© P.D. Szymoszczyk, MIZPAN)

Synonyms

Among Krüger's Odonata names there are a relatively high number of synonyms: That originates from two factors: He did not have access to most of the types already described (cf. Krüger 1903: 289). And, as Ris (1910: 136) stated in case of Krüger's *Agrionoptera variabilis* (below p. 22) he relied too much on contradictory statements in the former publications having seen fewer specimens than necessary to be able "to distinguish easily the individual and unimportant {features} from the generic and relevant" (Ris 1909a: 13; cf. Fliedner 2021: 125). That means information from the literature did not suffice to eliminate any doubt about the correct classification of his specimens. So Krüger often decided to name taxa provisionally in case his attribution should prove to be wrong. For example that is the case in the first taxon dealt with in this chapter. In one case he withdrew a name later himself (see below s.v. *iricolor* p. 26).

apicalis, *Rhinocypha* 1898: 79 [= *Heliocypha angusta* (Hagen in Selys, 1853: 62)]

L. *apicalis* –is –e = concerning the apex

Krüger surmised that his sole specimen pertained to *Rhinocypha bisignata* Hagen in Selys, 1853: 62 (L. = with two marks, due to two hyaline bands in the dark apical part of the hind wings of the males), but he was not sure: "Der dunkle Fleck sowohl der Vorder- als auch der Hinterflügel nimmt nur die Spitze ein, setzt sich aber als schmaler, kräftiger brauner Costalrand bis etwa $\frac{2}{3}$ zum Nodus hin fort. ... Sollte das Thier eine neue Art sein, so würde diese *Rhinocypha apicalis* zu nennen sein [The dark section in the fore and in the hind wings as well covers only the apex, but extends as a narrow, strong brown costal margin about two thirds to the nodus. ... If this animal pertains to a new species, it should be named *Rhinocypha apicalis*]." But Krüger was mistaken, as his specimen really pertained to the species mentioned in his paper and in Selys 1853 directly before *R. bisignata*: *Heliocypha angusta*, which was named from this feature: "Ailes pontues très-étroites [wings pointed, very narrow]:"

arba, *Disparoneura* 1898: 112 [= *Prodasineura verticalis* (Selys, 1860: 453)]

This is Krüger's sole eponym named after someone who was not one of the leading entomologists of his time or a European collector: "Benannt nach dem Hauptsammler Dohrn's unter den Eingeborenen [Named after Dohrn's most important collector among the natives]". In Selys' name the Latin adjective *verticalis* is not used in the prevailing meaning 'perpendicular', but as 'concerning the vertex' as to be seen from this clause in the description: "Une bande rouge au vertex, traversant l'ocelle antérieur [A red band at the vertex, crossing the fore ocellus]."

assimilis, *Leptogomphus* 1899a: 307 [= *L. lansbergei* Selys, 1878a:446]

L. *assimilis* –is –e = similar, like

After quoting his 6 specimens from Sukanranda (Sumatra) as *L. lansbergei* (described from Java) Krüger states some differences to Selys' description. Finally he sums up (p. 308): "Ich halte die hiesigen Thiere für *Leptog. lansbergei* Selys . Sollten ihre Unterschiede hinreichend erscheinen zur Aufstellung einer neuen Art, so ist diese *assimilis* n.sp. zu benennen [I consider the animals from here {from Sumatra} to be *Leptogomphus lansbergei* Selys {from Java}. If their differences appear sufficient for the establishment of a new species, it should be named *assimilis* n.sp]." Selys named the

species after the person to whom he owed his specimen: "Une femelle envoyée par M. Van Lansberge, gouverneur general des Indes Néerlandaises et entomologiste très-distingué [One female received from M. Van Lansberge, Governor-General of the Dutch East Indies and a highly distinguished entomologist]" (more about the eponym Beolens 2018: 236).

borneensis, *Macromia* 1899b: 330 [= *M. cincta* Rambur, 1842:141]

L. borneensis –is -e = Bornean, from Borneo

Krüger's single ♀ specimen was from Brunei (Borneo). In his description he concedes (p. 332): "Somit ist eine weitreichende Uebereinstimmung mit *cincta* vorhanden, andererseits sind Unterschiede in der Größe, Färbung und in der Scheidenklappe da, welche diese neue Art wie *flavicincta* von *cincta* trennen [hence there is an extensive conformity with *cincta*, on the other hand there are differences in size, coloration, and in the vulvar scale which separate this new species from *cincta*, as well as from *flavicincta* {Selys, 1874; L. = girded yellow}]." Rambur's name points to the following feature: "thorace vitta albido-flava cincta [the thorax girded by a whitish yellow band]."

braueri, *Rhincocypha* 1898: 133 [= *R. sumbana* Förster, 1897: 334]

Krüger does not explain his choice of name, but it certainly is an homage to the most famous Austrian odonatologist of that time Friedrich Moritz Brauer (1832-1904: more about him Beolens 2018: 55; Fliedner 2020). He stated the similarity to the taxa *R. pagenstecheri* [named after the German Lepidopterologist Arnold Pagenstecher (1837-1913; see Beolens 2018: 319), however not in gratitude for the type specimen, as Beolens erroneously stated, but for being sent Pagenstecher's publication on the Lepidoptera from the lesser Sunda islands Sumba and Sumbawa, see Förster 1897: 333] and *R. sumbana* [named after its provenance Sumba island] in the exceptional yellowish red coloration of the abdomen. Krüger did not recognise that his specimens were really Förster's taxon *R. sumbana* in spite of their provenance from the same island and being received from the same trader [the collector Mr. Grelak was an employee of H. Fruhstorfer], because their wings were completely without any colour, while Förster had stated that the wing tips of the hindwings were dark.

dauj, *Lyriothemis* 1902a: 157 [= *L. magnificata* (Selys, 1878b: 311)]

In a footnote to the first description it reads: "Die beiden Arten *Lyriothemis Dauj* ♂ n. sp. und *Lyriothemis Laui* ♀ n. sp. habe ich nach meinen getreuen Wandergefährten, den Herren Hans Dau und Dr. Friedrich Lau benannt, denen ich sie widme [The two species *L. Dauj* ♂ n. sp. und *L. Laui* ♀ n. sp. I have named after my constant companions in hiking {might have been collecting trips, cf Krüger 1925d: 89}, to whom I dedicate these." About Hans Dau I could find not more than this note. He is not mentioned in the Stettin directory of addresses for that time; so he probably lived at some place near that town. Selys' name *L. magnificata* [L. = magnified] for the taxon probably refers to the fact that it differs from the species *Calothemis priapea* [= pretty *Themis*, pertaining to the ithyphallic garden god Priapus, a younger synonym of *Lyriothemis cleis* Brauer) described directly before by these features: "Taille plus forte, ptérostigma plus long (4 millimètres) [Size larger, pterostigma longer (4 mm)]."

dohrni, *Alloneura* 1898: 114

[= *Prodasineura collaris* (Selys, 1860: 455)]

Krüger dedicated the species to Heinrich Dohrn (see p. 6), whose odonate collection from Sumatra he had been asked to describe. The Selysian name *collaris* [L. = pertaining to the neck] refers to the shape of the rear margin of the prothorax of the females by which the taxon differs from other species: "Les femelles diffèrent de celles de trois autres espèces qui sont connues, par la forme du prothorax à lobe postérieur non redressé [The females differ from those of the other three species {of *Alloneura*, now *Prodasineura*}, that are known, by the shape of the rear lobe of the prothorax which is not erect]."

dohrni, *Idionyx* 1899b: 326

[= *I. yolanda* Selys, 1871: 520] (Fig. 10)

In his description Krüger states: "Die von Dohrn aus Sumatra gebrachte kleine *Idionyx*-Art ist ebenfalls neu [the small *Idionyx* species brought from Sumatra by Dohrn is new as well]". But on p. 329 he asserts that the upper appendages of the males are similar to those of *I. yolanda*. Yolanda is a female given name in several languages, a form of *Jolanthe*, probably derived from Greek *ióλη* (= violet) and *άνθη* (= blossom). Of the three specimens Krüger mentions in his publication two are at the Naturalis Center Leiden.

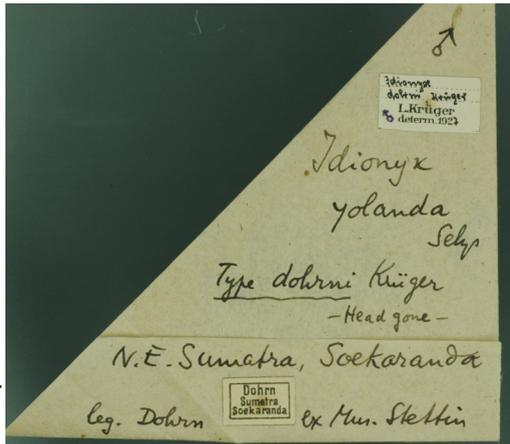


Fig. 10. Paper cover of a fragmented ♂ specimen of Krüger's *Idionyx dohrni* (younger synonym of *I. yolanda* Selys) which Lieftinck made the lectotype of the species. So the remaining ♂ at MIZPAN now ranks as paralectotype (© Naturalis Biodiversity Center Leiden)

flava, *Tetrathemis* 1902a: 190

[= *T. platyptera* Selys, 1878b: 316]

L. flavus –a –um = golden yellow, reddish yellow, flaxen-colored, blonde

Krüger discusses the different characters of the known *Tetrathemis* species (pp. 188-190) and mentions that *T. platyptera* Selys has the fore wings yellow up to the triangle, in the hind wings up to the nodus, but according to Karsch has a black prothorax. He has in the Dohrn collection a pair from Java which agrees with Selys' description in wing coloration, but the rear margin of their prothorax is yellow, and there is a slight difference in the number of submedian cross veins (2 instead of 3). So he states: "Ich halte dieses Pärchen vorläufig für eine neue Art: *Tetrathemis flava* n. sp. [For the present I take this pair to be a new species]." So Krüger's name probably refers to the yellow rear margin

of the prothorax as a distinguishing feature from *T. platyptera* Selys [Gr. = broad winged]. That species got its name from this character: "Ailes ... inferieurs ... élargies aux milieu (larges de 7 1/2 mm)" [Hind wings widened in the middle (7 1/2 mm broad)]."

fruhstorferi, *Alloneura* 1898: 138 [= *Nososticta insignis* (Selys, 1886: 181)]

Krüger named the taxon after the German collector, trader and entomologist Hans Fruhstorfer [1866-1922] who had collected his specimens in Java (about him Martin 1922; Beolens 2018: 143). Fruhstorfer, when he was a juvenile employee in a shop for natural products at Berlin, was amazed by the prettiness of exotic butterflies, so that he decided to go collecting himself. On his journeys he visited Brazil, Ceylon, Indonesia, then established a shop in Berlin for the collected material and sent employees to collect for him. Later (1899-1902) he collected in the USA, Japan, China and Indochina. Before the First World War he settled in Switzerland, but moved to Munich in 1920, where he died after an unsuccessful operation for cancer. Apart from Krüger's synonym other odonate species which he had collected were dedicated to him by Karsch, René Martin and a last one by Lieftinck in 1934, who adopted a name from the label at the Selys collection. In his description Krüger stated: "Sie steht *insignis* Selys am nächsten [It is closest to *insignis* Selys]", but he saw some differences from the description of that taxon. Selys probably had chosen the name *insignis* [L. = remarkable, noted, eminent, extraordinary] for this reason: "C'est la plus grande et la plus belle espèce de ce sous-genre [It is the largest and prettiest species of this subgenus]" (p. 182).

grandis, *Sieboldius* 1899a: 311 [= *S. japonicus* Selys, 1854: 83]

L. *grandis* -is -e = large, great, dignified, noble

The name was chosen, because Krüger was convinced "*S. grandis* n.sp. übertrifft *japonicus* Selys ein wenig an Größe [*S. grandis* n.sp. exceeds *japonicus* Selys a little in size]." He described the taxon as a new species because the occiput of his female specimen did not have the two sharp points at the rear margin, which should be there according to Selys 1858: 505 and the sketch drawn by Selys (fig. 13.3g, cf. explanation p. 705). The name *japonicus* [L. = from Japan] was given by Selys because erroneously he thought that his specimens were from there. But in Selys 1883: 115 he corrected "Aujourd'hui je soupçonne que l'indication Japon est erronée, parce que je n'ai pas vu cette espèce dans les autres collections du Japon que j' ai examinées ... Dans ce cas, le nom que j' ai donné est malheureusement choisi [Now I suspect that the indication 'Japan' is erroneous as I have not seen this species in the other collections from Japan that I have examined ... In this case the name I have given is chosen by mischance]". According to Lieftinck 1971: 94 the species is distributed in Malaya, Sumatra and Borneo.

iricolor, *Echo* 1898: 72 [= *E. uniformis* Selys, 1879: 357]

L. *iris* = rainbow + -color = coloured

Krüger described his specimens as *Echo uniformis* Selys, but he adds: "Diese Art ist bis jetzt nur in 1 ♂ -Exemplar (Mus. in Wien) bekannt. Selys hat dieselbe nur oberflächlich beschrieben: ... Es scheint aber diese kurze Beschreibung zu der Annahme zu berechtigen, daß die vorliegenden Thiere derselben Art angehören. Sollte eine genaue

Beschreibung des Wiener Exemplars bedeutende Abweichungen ergeben, so würden diese Thiere eine neue Art bilden, welche dann *Echo iricolor* n.sp. benannt wird [This species is presently known from but 1 ♂ specimen (Museum at Vienna). Selys described it just superficially... But this short description seems to justify the assumption that the specimens at hand pertain to that very species. If a more thorough description would show major discrepancies, my animals would form a new species which in that case is to be named *Echo iricolor* n.sp.]. At the base of Krüger's name is this feature: "Die Flügel sind hyalin ... oben und unten prächtig blau bis violett irisierend [The wings are hyaline ... above and beneath prettily blue to violet iridescent]." But Krüger 1899a: 330 retracts his provisional name: "Während der I. Theil meiner Arbeit: Die Odonaten von Sumatra im Druck war, hat Selys eine vollständige Beschreibung seiner *Echo uniformis* ♂ und ♀ gegeben. Diese stimmt mit der meinigen in so vorzüglicher Weise überein, daß an der Identität seiner Exemplare mit den hiesigen nicht gezweifelt werden kann. Es ist damit der von mir event. vorgeschlagene Name *E. iricolor* hinfällig geworden. Derselbe ist also in meiner Arbeit überall zu streichen [While the first part of my treatise 'The Odonata of Sumatra' was printed, Selys gave a complete description of his *Echo uniformis* ♂ and ♀. That is in agreement with my own in such an excellent manner, that the identity of his specimens with the present ones cannot be doubted. Due to that the name *E. iricolor* suggested by me conditionally has become invalid. It therefore has to be deleted everywhere in my publication]. Selys' name *uniformis* [L. = uniform] refers to this feature, by which the species is distinguished from *E. margerita*: "... mais ses ailes sont uniformément hyalines un peu bleuâtres, irises, ayant à peu près l'apparence de celles de la *Cleis cincta* [... but its wings are uniformly hyaline a little dark blue, iridescent, having somewhat the appearance of *Cleis cincta*]."

karschi, *Rhinocypha* 1898: 83 [= *Sundacypha petiolata* (Sels, 1859: 447)]

This is another taxon named by Krüger after one of the leading odonatologists of his time without comment. Its eponym, Ferdinand Anton Franz Karsch (1853-1936), was a German arachnologist, entomologist and anthropologist, who was employed in Berlin at the Zoological Museum. In appreciation of his merits in taxonomy at least 30 valid taxa and 9 synonyms in various orders were dedicated to him. From 1903 he changed the subject of his publications focusing on homosexuality in the animal kingdom or in non-Western cultures (for more about him see Endersby & Fliedner 2015: 55-56; Beolens 2018: 212). In 1897 Karsch had been in the jury that had awarded a prize to Krüger for his treatise on insect migration between North America and central Europe (cf. p. 7-8; Jansen 2003: 226). The reason for the actual name of the species is found in the description of its wings: "Ailes pointues très-étroites, pétiolées jusqu'à l'arculus; hyalines [The pointed wings are very narrow, petiolate to the arculus, hyaline]."

loui, *Lyriothemis* 1902a: 156 [= *L. magnificata* (Selys, 1878b: 311)]

This is the second companion in hiking whom Krüger chose as eponym for his single ♀ of the same species already described by Selys, of which he had dedicated his sole ♂ to Hans Dau (see *dau* p. 23). Friedrich Lau (1869-1947) was a German historian and state archivist, who after having studied history at Freiburg, Berlin and Bonn and qualifying as archivist from 1898 to 1901 worked at the 'Staatsarchiv Stettin'. There he

also joined the 'Stettiner entomologische Gesellschaft'. Later he was employed in Düsseldorf analyzing and editing historical sources (cf. Beolens 2018: 237). For the Selysian taxon see p. 23 s.v. *daui*.

lobimargo, *Psilocnemis* 1898: 103 [= ***Copera imbricata*** (Hagen in Selys, 1863: 171)]
L. lobus = lobe (Latinised from Greek) + *margo* = edge, brink, border, margin

This species was described together with *C. acutimargo* (see p. 13). Also in this case the rear margin of the prothorax has led to the name: "Er ist nicht kurz, abgeschnitten und nach vorn umgelegt, sondern der Mittellappen ist groß und deutlich, schräg nach hinten gestellt und deutlich zweilappig [It is not short, cut off and bent forward, but the median lobe is large and distinct, directed obliquely rearward and distinctly bilobed]" (p. 106). The name *imbricata* used by Hagen is an adjective derived from Latin *imbrex* = hollow tile (for draining off the rain) and most probably refers to this feature: "Lobe postérieur un peu déprimé au milieu [Posterior lobe a little depressed in the middle]" by which this species is distinguished from that one described immediately before in that publication.

signatus, *Micromerus* 1898: 86 [= ***Libellago lineata*** (Burmeister, 1839: 826)] (Fig. 11)
L. signatus –*a* –*um* = marked / *lineatus* –*a* –*um* = marked with a straight line

In his description Krüger says (p. 88): "Thorax mit gelber Rückennaht, der obere Theil des unteren Mesothoraxwinkels und der ganze obere Mesothoraxwinkel gelb; über dem gelben Antehumeralstreifen ein gelber Punkt, sonst wie bei *lineatus* [Thorax with



Fig. 11. *Libellago lineata* ♀, 19. 10. 2018, Bali. Already in Krüger's description of his *M. signatus* there is the remark: "Die Uebereinstimmung mit *lineatus* ist auch in anderer Beziehung sehr groß [The similarity with *lineatus* is also very great in other respects]. The species later were synonymised by Lieftinck (1932: 9) © Peter Peitzner

a yellow dorsal suture, the upper part of the lower mesothoracic angle and the whole upper mesothoracic angle yellow, above the yellow antehumeral stripe a yellow mark, else like *lineatus*]." Already earlier in his description Krüger had noted that similarities to (*Micromerus*) *lineatus* were great, but seeing some differences he had decided that his specimens were a new species. Burmeister's name goes back to this feature: "thoracis dorso nigro-vittato [the dorsal part of the thorax banded black]." A more detailed description of the markings of the thorax is found in Selys 1853: 65. (For the

synonymy of the genus *Micromeris* Rambur, 1842 [Gr. = small part of the whole, probably in reference to the short abdomen in relation to the wings] with *Libellago* Selys, 1840 (below p. 37) see Lieftinck 1932: 2).

sumatrana, *Argiocnemis* 1898: 126 [= **A. rubescens** Selys, 1877: 136]

L. *Sumatranus* –a –um = from Sumatra

In his description of *A. rubeola* Selys (L. = reddish; a younger synonym of *A. rubescens* described on the page before), which was then known from Malaysia, Sulawesi, Java and the Philippines, Krüger emphasised that the species within that genus may vary very much. As his Sumatran specimens differ in some criteria from Selys' description, because of their lesser size he considered that one might "diese Thiere allerdings für eine neue lokale Rasse: *sumatrana* halten [indeed regard these animals as a new local subspecies]", but that just hypothetically. The name *rubescens* [L. = becoming red; reddish] given by Selys to a single ♀ from Queensland refers to its coloration: "D'un rougeâtre clair en dessus, passant au jaunâtre en dessous [Of a clear dark red above passing over to dark yellow underneath]."

sumatrana, *Neurothemis sophronia* 1903: 285 [= **N. fulvia** (Drury, 1773: pl. 46 fig. 2 + pp. 84-85)] (Fig. 12)

L. *Sumatranus* –a –um = from Sumatra

Krüger described his three males from Sumatra as a "Varietät [variety]" of *Neurothemis sophronia* (Drury), of which he was aware that Drury had described its female as *Libellula fulvia*; that means he was not sure about the taxonomic status of his specimens, and nowadays a variety would have no place in nomenclature because of its infrasubspecific status. The name *sophronia* probably goes back to the main female figure of the drama 'Olindo and Sophronia' published in 1758 by the goldsmith and poet Abraham Portal (1726-1809), the story of which was taken from the poem 'La Gerusalemme Liberata [Jerusalem delivered]' by the Italian poet Torquato Tasso (1544-1599) [for more about Sophronia see https://en.wikipedia.org/wiki/Jerusalem_Delivered]. Drury's name Fulvia, as most of his names in odonatological nomenclature, goes back to Roman antiquity and means 'female member of the clan of the Fulvii' who were an influential plebeian family. The most significant Fulvia was married to Marc Antony (83-30 BC), rival, partner and enemy of Caesar's heir Octavianus, who later was to become the emperor Augustus (about her see <https://en.wikipedia.org/wiki/Fulvia>).

sumatrana, *Tetrathemis* 1902a: 191 [= **T. irregularis** Brauer, 1868: 183]

L. *Sumatranus* –a –um = from Sumatra

Krüger was in doubt concerning some features of wing venation of Brauer's *Tetrathemis irregularis*. So he described three females collected by Dohrn at Sukaranda as *T. sumatrana* n. sp., but adds "(aut [or] *irregularis* Brauer)" which statement proved to be correct later.

The irregularity to which the name points is the fact, that in this species, for which Brauer introduced his genus *Tetrathemis*, the triangle is not really a triangle but quadrilateral: "Cellula cardinalis (Dreieck) in beiden Flügeln 4eckig, durch Knickung der



Fig. 12. *Neurothemis fulvia* ♀, 03.07.2013, Phuket, Thailand. Drury did not recognise that his *sophronia* and *fulvia* represent the two sexes of the same species (© Jürgen Ruddek).

Vorderseite [Cellula cardinalis (triangle) in both wings quadrangular as the anterior side of the triangle is bent].”

sumatranus, *Ictinus* 1899a: 315 [= *Ictinogomphus decoratus* (Selys, 1854: 89)]

L. *Sumatranus* –a –um = from Sumatra

Krüger's taxon was described as a Sumatran subspecies of *I. melaenops* Selys [Gr. = blackfaced; now seen as a subspecies of *I. decoratus* Selys (cf. Lieftinck 1948: 286)]. After comparing his specimens with the Selysian taxa Krüger stated (p. 316): “Diese Unterschiede nähern die hiesigen Thiere der Art *decoratus* Hoffms. sehr; aber die übrigen Merkmale stimmen genau mit denen von *melaenops* Selys überein und weichen konstant von denjenigen der Art *decoratus* Hoffms. ab, so dass ich die hiesigen Stücke nur für *melaenops* Selys halten kann. Die Unterschiede bedingen aber die Aufstellung einer sumatranischen Rasse dieser Art [These differences {from *melaenops*} bring about a close similarity of the local specimens to the species *decoratus* Hoffmanns-egg {the real author of the taxon was Selys; Burmeister 1839: 832 had mentioned the collection name *Diastatomma decorata* by the founder of the Berlin collection J.C. Graf Hoffmanns-egg (1766-1849) without a description of that taxon; this name had been adopted by Selys; but their other characters agree completely with those of *melaenops* Selys and disagree constantly with those of *decoratus* Hoffms., so that I can only regard the local specimens as *melaenops* Selys. The differences however demand the establishment of a Sumatran subspecies].” The name *decoratus* [L. = adorned, decorated] might refer to the conspicuous yellow pattern on the dark ground colour of the species (cf fig. 14 p. 36).

udeanus, *Lestes* 1898: 127

[= *Orolestes wallacei* (Kirby, 1889b: 302)]

L. suffix *-(a)nus -a -um* = pertaining to

Krüger does not explain his choice of name, but by its uppercase first letter it is clear that it is an adjective derived from a proper name. In ascribing the wrong feminine form of the adjective he follows the grammatically improper gender for *Lestes* like Selys and others (see Davies & Fliedner 1999: 37). The correct interpretation of the name is given by a preliminary remark in Krüger's publication by Heinrich Dohrn (p. 64). After having told that he had exploited the Sumatran province Deli entomologically in the years 1893-97 he states: "zu diesem Behufe hatte ich bereits bei meiner ersten Reise als Präparator Herrn Max Ude aus Berlin engagiert, welcher über ein Jahr draußen blieb und eine Anzahl geschickter Eingeborener beim Sammeln beschäftigen konnte [for this purpose already on my first journey I had employed Mr. Max Ude from Berlin as a preparator who stayed abroad more than one year and who managed to engage a number of skilful natives for collecting]". Kirby described the species from a female in the British Museum collected at Sarawak in Borneo by the famous A.R. Wallace, who had developed the theory of evolution (for more about him see Beolens 218: 436) together with Darwin.

variabilis, *Agrionoptera* 1902a: 172-177[= *A. insignis* (Rambur, 1842: 123)] (Fig. 13)

L. *variabilis -is -e* = changeable, variable

In his publication Krüger tried to elucidate the taxonomic differences in the genus *Agrionoptera* Brauer. He concluded that besides *A. longitudinalis* Selys and *A. mysis* Selys (already transferred to the genus *Nesoxenia* Kirby in Ris 1900: 181) there were three species of *Agrionoptera*: *A. nicobarica* Brauer (now seen as subspecies of *A.*



Fig. 13. *Agrionoptera insignis* ♂, 30.07. 2017 Bali. The species name reflects the unusual narrowness of the hindwing bases for a dragonfly (as does the genus name), not its conspicuous coloration. (© Gabi Peitzner)

insignis), *A. insignis* Rambur and: "eine dritte Art, welche ich vorläufig *variabilis* nennen will, bis festgestellt ist, welche der Formen *similis* Selys, *papuensis* Selys, *insularis* Kirby, *salomonis* Förster am besten die Art vertritt [a third species, which I provisionally will name *variabilis*, until it has been found out which one of the varieties *similis* Selys, *papuensis* Selys, *insularis* Kirby, *salomonis* Förster represents the species best];" that means he saw his result as a provisional one which should be discarded as soon as clear conclusions had been achieved about the relations between those varieties, which now are seen as synonyms of the widespread and polymorphic Ramburian species except *A. similis*, which in Paulson & Schorr 2020 is tagged as "(doubtful species ?)".

Ris 1910: 136 assessed Krüger's efforts thus: "Krüger's Aufstellung der *A. variabilis* ist nur erklärlich daraus dass Krüger nur wenige Exemplare selbst untersucht hatte und zu grossen Wert auf die sich vielfach widersprechenden Angaben in der Literatur legte [Krüger's introduction of *A. variabilis* may be understood only from the fact that Krüger examined just a few specimens himself and attached too much importance to the statements from literature, which contradict each other in many cases]."

Rambur's species got its name *insignis* [L. = remarkable, extraordinary] because it is "très remarquable par l'étroitesse de la base des ailes inférieures [very remarkable by the narrowness of the bases of its hindwings]."

Misidentification

hypermelas, *Pseudagrion* Krüger 1898: 119 ≠ (Selys 1876: 519) → *Aciagrion feuerborni* Schmidt 1934: 344

Gr. ὑπέρ = above, exceeding + μέλας, μέλαινα, μέλαν = black, dark

In the description of his specimens Krüger stated some differences to Selys' taxon from India, but nevertheless was convinced that it pertained to that species, which probably got its name from this feature by which is distinguished from other species: "L'espèce fort distincte par le dessus des 8e et 9e segments noir comme les autres [The species is very distinct {from *P. decorum* (Rambur) (L. = seemly, decorous)} by the eighth and ninth segments being black dorsally like the others]." In 1934 Er. Schmidt in the odonatological evaluation of the 'Deutsche limnologischen Expedition' to the Sunda Islands in 1928-29 dedicated the new species to Heinrich Jacob Feuerborn (1883-1979), a German zoologist: "Die Art wurde zu Ehren von Herrn Prof. Feuerborn-Münster, einem der Expeditionsteilnehmer, benannt [The species was named in honour of professor Feuerborn from Münster, who has participated in this expedition]." Feuerborn later engaged himself in the Nazi party (more about him: Beolens 2018: 133, who erroneously places him for the years 1936-1945 at Munich, while he really was employed in Berlin).

Neither Schmidt nor Lieftinck, to whom Schmidt donated the type specimen in 1935 for a publication on the dragonflies of Sumatra (Lieftinck 1935, see Lieftinck 1971: 88) saw at that time that the new species was identical with the taxon described by Krüger under the Selysian name, whereas Lieftinck (1935: 11) already doubted the presence of the Selysian species on Sumatra. Finally Lieftinck in his list of Odonata from Malaysia, Sumatra, Java and Borneo (1954: 76) confirmed that synonymy.

Actual genera

Aciagrion Selys, 1891: 509

Gr. ἀκίς = pointed object, hence needle + *-agrion* see below

Linné's disciple J.C. Fabricius (1775: 425) chose the name *Agrion* (Gr. ἄγριος –α –οv = living in the fields; probably because damselflies, unlike house flies, usually do not live in the domestic area) for a genus to include all damselflies. Later on new zygopteran genera were excised from that genus, like *Calopteryx* Leach. So in the 19th century *Agrion* was widely accepted as a genus name for all non-Calopterygid damselflies which had not been transferred to different genera. But Kirby (if not other scientists as well) had the opinion that in Latreille 1802 (p. 287) *Libellula virgo* Linnaeus had been named as the only species of the genus *Agrion* therefore being elected as type of that genus. This rendered *Calopteryx* Leach into being a junior synonym and so the practice to use *Agrion* for all non-Calopterygid Zygoptera which were not attributed to a different genus had to be wrong. Due to this conviction Kirby created the name *Coenagrion* (= common *Agrion*) (1890: 148) for the taxon *Agrion* as it had been used in taxonomy until then. After long controversies about the correct use of the name *Agrion* his amendment later was accepted by ICZN, but the name *Calopteryx* Leach was maintained as well. So now *Agrion* is only found as an element in compound names as in this case, meaning 'coenagrionid damselfly'.

The name *Aciagrion* was chosen by Selys due to this feature of the genus: "Abdomen long, excessivement grêle [Abdomen long, exceedingly slender]".

Agrionoptera Brauer, 1864: 163

Gr. ἄγριος –α –οv = living on the fields, wild + Latinised feminine form from Gr. –πτερος = winged

Brauer gave this name to a libellulid genus the wings of which in his opinion resembled wings of Zygoptera, to which he refers by the genus name *Agrion* Fabricius (for which see above s.v. *Aciagrion*): "Vorder- und Hinterflügel fast gleich gross, letzterer am Grunde nicht erweitert, kaum breiter als ersterer, beide am Hinterrande abgerundet, in der Gestalt den Flügeln der Agrioniden (*Euphaea*) im weiteren Sinne ähnlich [Forewing and hindwing of about the same size, the latter not expanded at the base, hardly broader than the former, both rounded at the rear margin, the shape of the wings similar to those of the agrionids in a broader sense (*Euphaea*)]" (for *Euphaea* see p. 35).

Amphicnemis Selys, 1863: 152

Gr. ἀμφί = on both sides + κνημίς = greave, legging, as a reference to the genus *Platycnemis* (= broad greave, because of the widened tibiae)

Selys described this genus in the publication in which he established his 'légion *Platycnemis*', which should comprise the taxa closely related to the genus *Platycnemis*. Together with *Amphicnemis* he published seven additional taxa in *-cnemis*, three of them suggested by Hagen. Two of these names later had to be changed because of homonymy, which also applies to *Trichocnemis* [Gr. = hair legging, as a reference to ciliate tibiae], the first taxon in *-cnemis* created by Selys (1857: 464). Later on Selys recognised that not all of these genera, among which also was *Amphicnemis*, per-

tained to the Platycnemididae. So the morpheme *-cnemis* may just mean 'coenagrionid damselfly'.

Selys explains his choice of name thus: "NB. Ressemblent aux *Amphilestes* ... [Resembling *Amphilestes*]". That taxon (now *Rhinagrion* Calvert because of homonymy, see p. 40) got its name from dark olive reniform spots on both sides of the thorax of the single species included in it when established (see Selys 1862b: 42).

Argiocnemis Selys, 1877: 135

Gr. Ἀργεία = the woman from Argos; for *-cnemis* see *Amphicnemis* (foregoing lemma)

For the explanation of this name we have to immerse ourselves deeply into the history of odonatological nomenclature. Fabricius (1775: 425) had created the zygopteran genus *Agrion* (see above s.v. *Aciagrion*). Rambur (1842: 254) established a new genus *Argia* to comprise five species, the similarity of which to the genus *Agrion* of his time he emphasises. The name of the new genus probably was inspired by Greek mythology, where *Argia* was the wife of Polyneikes, son of Oedipus, who wanted to regain rule over Thebes with six allies, after he had been expelled by his brother and rival Eteokles. Such a genus name however would be unique with Rambur, as all others created by him refer to a quality of the respective genus or compare it with a bird of prey. Anyway it seems that he chose a name as similar to *Agrion* as possible without generating confusion.

Of Rambur's five species in that genus two were from South America, two from India and one from Waigeo, an island near the easternmost part of New Guinea. Selys (1860: 446 + 448) classified the Indian species into two new genera of his 'legion *Protonevra*' which is characterised by its rather simple reticulation of the wings. Two years later (1862b: 38) he placed the species from Waigeo in the genus *Argiolestes* combining the name of its original genus with that of *Lestes* (cf. p. 37) because of some similarity with that taxon which he did not assess as a real affinity (1862b: 8). So in the genus *Argia* only remained the two species from South America, to which Selys (1865) with Hagen's assistance added more species also from North America. Later Selys (1877) attended to the last groups of Agrionidae, in which publication he withdrew several genera (e.g. *Amphicnemis* cf. above) from his 'légion *Platycnemis*' and established the genus *Argiocnemis*, stating: "Précédemment j'avais pensé que les *Argiocnemis* devaient se placer à la suite de la légion du *Platycnemis* [Formerly I'd thought that the *Argiocnemis* should be placed directly behind the 'legion *Platycnemis*']", but then had seen criteria which raised objections to this. So with some doubt he explained its taxonomical position "On pourrait le colloquer après les *Argia* et avant les *Agrion* [One might place it after *Argia* and before *Agrion*]" (p. 136). The new genus he divided into the 'sous-genres' *Argiocnemis* and *Agriocnemis* according to their affinity to the adjoining genera, of which he assessed *Agrion* to be more advanced in evolutionary terms. But both taxa now have generic rank.

Brachydiplax Brauer, 1868: 172

Gr. βραχύς –εῖα –ύ = short + *Diplax* (see below)

The genus name *Diplax* is out of use now, as it is a younger synonym of *Sympetrum* Newman, 1833, but it is found as second element in several compound names, the

last of which (*Nothodiplax* ≈ spurious *Diplax*, probably because it is near to *Erythrodiplax*, but differs from it in some essential features) was forged by Belle in 1984 (p. 6). In 1840 Charpentier had established a libellulid genus named *Diplax* which name he explained thus: "Nomen e Graecis vocabulis δῖς et πλάξ derivatum ob prothoracis formam ... Prothorax in postica parte elevatus vel erectus in plagulam vel discum a duobus semicirculis formatum [The name is derived from the Greek words δῖς (= twice, doubly) and πλάξ (= anything flat and broad) because of the shape of the prothorax. ... The prothorax is elevated or erect in its hind part into a little area or disk formed by two semicircles]" (p.12). That means this shape of the prothorax, which is at the base of the name, is similar to the upper case letter B. As the priority of *Sympetrum* was not known commonly until about 1880 *Diplax* was considered to be the correct name (see Hagen 1888). So when Brauer was in need of new names for libellulid genera he decided to use the element *-diplax* for them irrespective of the shape of their prothorax, and this custom was followed by others. The first species Brauer classified as *Brachydiplax* has a short abdomen: "Hinterleib kurz, dreiseitig, am Grunde etwas dicker [Abdomen short, trilateral, somewhat thicker at the base]" (1868, 173).

Copera Kirby, 1890: 25

Southamerican Span. *copera* = waitress (derived from *copa* = cup)

This is a replacement name by Kirby for the preoccupied Selysian name *Psilocnemis* (≈ simple greave) for a platycnemidid genus, in which the tibiae are scarcely widened (Selys 1863: 168). Kirby's name seems to be another one of the names referring to attractive womanliness, the first of which in odonatological nomenclature were Linnaeus' species names *virgo* (= maiden) and *puella* (= girl), probably inspired by vernacular names for dragonflies like French 'demoiselles' (that word is also at the base of the English term 'damselflies').

Drepanosticta Laidlaw 1917: 339

Gr. δρέπανον = sickle + στικτός -ή -όν = pricked, tattooed; spotted, dappled

Laidlaw does not give any explanation why he chose this name and it seems a little enigmatic as in his first description nowhere is a sickle-shaped mark mentioned. So undoubtedly *-sticta* in this name is a reference to Selys' "legion *Platysticta* [Gr. = broad marked, with reference to the pterostigma]", into which Laidlaw classified his new genus. Probably the name refers to the male's upper appendages of the type species, which are sickle-shaped in lateral view (see Laidlaw 1915: 390 and Laidlaw 1917: pl. XIV, 4a).

Echo Selys 1853: 19

Gr. Ἠχώ = *Echo*, a mountain nymph from Greek mythology (from Gr. ἦχος = sound)

Ovid tells us that *Echo* was a mountain nymph who was told by Jupiter (Gr. Zeus), the supreme god, to detain his jealous wife Juno (Gr. Hera) with long conversations when she tried to catch him in one of his numerous love affairs. When Juno found that out she cursed *Echo* so that the nymph could no longer speak by herself, but only repeat the most recently spoken words directed at her. In that publication Selys established also other names referring to attractive womanliness for calopterygid damselflies like *Sylphis* (= sylphid, a spirit of air introduced by Paracelsus) or *Cleis* and *Mnais* (typical names of courtesans in Greek antiquity, cf. Fliedner 2021: 111).

Euphaea Selys, 1840: 200

This was the first name for an odonate genus published by Selys. The name probably is derived from the Greek adjective εὐφαής = very bright. Erroneously it was suggested for the North American species *Calopteryx holoserica* Burmeister (= *C. maculata* Palisot de Beauvois) said to be from Java. In Selys 1898: 338 he corrected his error, informing us that really *E. variegata* Rambur (see p. 18 s.v. *intermedia*) was the species he had had in mind when he created the genus.

Euthygomphus Kosterin 2016: 51

Gr. εὐθύς = straight, direct + γόμφος = bolt for shipbuilding

Leach (1815: 137) established the genus *Gomphus* for dragonflies “with a clavate abdomen in both sexes” not knowing that this would be the initial point for one of the largest anisopteran families at all. In his ‘Synopsis des Gomphines’ Selys created the first 13 compound names for genera related to *Gomphus* Leach. When Kosterin examined the genus *Merogomphus* Martin, 1904 (Gr. μηρός = thigh; in entomological genus names: femur; the name refers to the very long femora (1.5 mm) of the type species), he saw that it was artificial, because some of its species had lyrate cerci and others straight ones and moderately divergent epiprocts, for which latter group he established the new genus *Euthygomphus* including also some species placed in the genus *Anisogomphus* Selys, 1857 before.

Gynacantha Rambur, 1842: 209

Gr. γυνή = woman + ἄκανθα = thorn, prickle.

Rambur informs us, that this taxon differs from *Anax* and *Aeshna* by spines beneath the tenth abdominal segment of the females.

Heliaeschna Selys 1882: 667

Gr. ἔλικες = forked tendrils of the vine + genus name *Aeshna* (for the spelling see below)

In 1775 Fabricius had split the genus *Libellula* Linnaeus into three, creating the new genera *Agrion* (see above *Aciagrion* p. 32) for the damselflies and *Aeshna* for the non-libellulid Anisoptera. Some scientists thought Fabricius' name was derived from Greek αἰσχύνη = shame and explained the name from the observation that aeshnids were rarely seen in copula. Because of this derivation, the name was therefore emended to *Aeschna* (Illiger, 1802: 126). As this emendation was widely accepted in the 19th century compound names established then, like in this one, are mostly written with c. But Fabricius himself kept to the orthography without c until his death. Because of this discrepancy the ICZN in opinion 34 decided, that *Aeshna* had to be maintained, as Fabricius had not explained his name in any way and an orthographical slip therefore could not be proven. The etymology of the name is not known, whereas *Aeschna* (with c) in the 17th century in England was in use for Ephemeroptera (e.g. Moufetiuis, 1634: 69; Charleton 1677: 42). The Selysian name most probably is due to this feature: “♀ Le 10e segment prolongé en dessous en une plaque fourchue procombante, à branches fines, longues, aiguës, écartés [♀ 10th segment elongated into a prominent forked plate with fine, long, pointed, splayed branches]”.

Heliocypha Fraser 1949: 11-12

Gr. ἥλιος = sun + -cypha (a reference to the related genus *Rhinocypha*, see p. 40)

There are several genus names ending in *-cypha* for taxa that share the hunched *rhinarium* of *Rhinocypha*. Fraser when establishing and naming this new taxon followed a suggestion of F.F. Laidlaw, but he does not say what the name means. The sun might be quoted because the species of this taxon, which normally perch in shade as do those of *Rhinocypha*, are an extraordinary sight when flying in sunshine (A. Günther; pers. comm.). But it is to be noted that the distribution of this genus is very similar to that of *Heliogomphus* named by Laidlaw (see next lemma). So that might have led to the name.

Heliogomphus Laidlaw, 1922: 378-79

Gr. ἥλιος = sun + *Gomphus* (see *Euthygomphus* p. 35)

Laidlaw did not explain the name of his taxon which he split from the genus *Leptogomphus* Selys (see p. 37), but he included species from Ceylon and Assam, from Sumatra, from Tonkin and from Yunnan, that means from sunny regions. But it might be noted that Krüger (1915b: 80) suggested an osmylid genus *Heliosmylus* for species from Japan and Taiwan, which he explained: "Name von Helios = Sonne, hier nach dem Vaterlande der zugehörigen Arten ..., den Ländern der aufgehenden Sonne ... gebraucht [Named from Helios = sun, here used after the homeland of the species in question ..., the lands of the rising sun ...]". From European point of view that would also apply to the occurrence of the species of *Heliocypha* or *Heliogomphus*.

Ictinogomphus Cowley, 1934b: 274 (Fig. 14)

Gr. ἰκτινος = kite (a bird of prey); for *-gomphus* see *Euthygomphus* p. 35

This is Cowley's replacement name for Rambur's gomphid genus *Ictinus*, because that name was preoccupied by a genus of beetle named eight years earlier.



Fig. 14. *Ictinogomphus decoratus* ♂, 23.07.2011, Khao Lak, Thailand. The leaflike foliations of the eighth segment which frequently occur in the Lindeniinae are well to be recognized. (© Jürgen Ruddek)

Idionyx Selys in Hagen, 1867: 62

Gr. ἴδιος –α –ον= one's own; a peculiar kind of + ὄνυξ = talon, claw

In 1867: 58 Hagen announced that two genera would be described by Selys which were peculiar by their claws, whose teeth were of an equal length as the claws themselves, so that they looked bifid. One of these was the libellulid genus *Zygonyx* (≈ equal pair of claws), the other one *Idionyx*, which by Selys (1871: 519) was classified in his "légion *Macromia*", but in Carle & al. 2015 (pp. 289+295) is placed among the Synthemistidae s.l.

Leptogomphus Selys, 1878a: 442

Gr. λεπτός –ή –όν = thin, fine, delicate + *Gomphus* (see *Euthygomphus* p. 35)

As usual there is no explanation of the name in the first description, but for all three species included into the new genus Selys states: "abdomen grêle [abdomen thin] (pp. 443, 445, 446).

Lestes Leach in Brewster, 1815: 137

Gr. ληστής = robber; the Latinised form *Lestes* is accentuated on the first syllable

This is one of two new genera of damselflies created by Leach, but he does not explain why he chose this name. It does not give a diagnostic clue either because all Odonata are predators. It should be noted, that *Lestes* cannot be but masculine, whereas Selys (and others after him) erroneously used it in feminine gender (see Davies & Fliedner 1999: 37). Currently there are many compound genus names ending in *-lestes*. The first of these Selys (1862a) introduced within his 'légion *Lestes*' which should comprise all genera related to *Lestes* Leach; but in his next publication (1862b) in his 'légion *Podagrion*' he established more genera with this element which he assessed not to be lestids, but only showing some similarities to Leach's genus (cf. *Argiolestes* p. 33 s.v. *Argio-cnemis*). Some of these, e.g. the African genus *Chlorolestes*, are now placed in the superfamily Lestoidea, which forms "a sister group to all other 93% of damselflies" (Dijkstra et al. 2014: 71). Others however are not; therefore a name ending in *-lestes* neither warrants that it is a lestid genus nor that it pertains to the superfamily Lestoidea.

Libellago Selys, 1840: 200

This is the second odonate genus name established by Selys. The name, while not being an ancient word, nevertheless seems to be formed of Latin elements, *libell-* derived from *libell(ul)a*, combined with *-ago*, which we find e.g. in *virago* [L. = heroine], which means "with the characteristics of a man [L. *vir*]". Selys explains his choice of name for this calopterygid genus as follows: "Ce genre, très-distinct sous tous le rapports, rapelle certains Libellules [This genus, very distinct in all respects, is reminiscent of certain dragonflies]." This similarity might be seen in the fact that in this genus the abdomen is shorter than the wings, a common feature in libellulids, which is even more evident in mounted specimens (for *Libellula* Linnaeus see Fliedner 2012; Fliedner & Endersby 2019: 175).

Lyriothemis Brauer, 1868: 180

Gr. λύριον = a small lyre; for *-themis* ≈ libellulid dragonfly see below

In the single species included in the genus when founded (*L. cleis*) the male's supe-

rior appendages are somewhat shaped like the gently curved arms of a lyre (p. 182).

Themis was never a dragonfly name by its own. It was established as an element in odonatological nomenclature by Hagen (1861), when he had to name many new North American genera. He was inspired by generic names in *-etrum* suggested for new libellulid genera by Newman (1833) (e.g. *Orthetrum* see Fliedner 2021: 113) which seemed not to have been adopted in odonatology; but he wanted to avoid a change in gender for adjectival species names transferred from the feminine *Libellula*. So he chose the feminine element *-themis* as second part of the new names instead which should denote a libellulid dragonfly genus (see Hagen 1888). Probably he was inspired in his choice by names of divine beings in nomenclature like *Echo* (cf. p. 34). This habit was followed by many other taxonomists. Later on however the element *-themis* was also employed for corduliid and synthemistid dragonflies [Gr. θέμις originally means 'that which is established by custom, law' and personified that was the goddess of order, which makes a good patroness of taxonomy].

Macromia Rambur, 1842: 137

Gr. μακρός *-ά -όν* = long, extensive, + ὤμος = shoulder + feminine form of the suffix *-ιος -ια -ιον* = concerning

Characteristic for this genus is that in its wings the humeral part of the costal edge is at least twice as long as the cubital as far as the pterostigma (The reference of the name to the equally long tarsal nails by Williamson (1899: 231, 307) is erroneous, see Endersby & Fliedner 2015: 174-175).

Megalogomphus Campion, 1923: 669

Gr. μεγάλο- = large; for *-gomphus* see *Euthygomphus* p. 35

Selys 1854: 27 had established a genus *Hetero-gomphus* (= different *Gomphus*), one characteristic of which was: "remarquables par leur taille grande [remarkable by their large size]" (Selys 1858: 355). So Campion, when he saw that Selys' name was preoccupied by a genus in Coleoptera, he replaced it by *Megalogomphus*.

Neurothemis Brauer, 1867: 6

Gr. νεῦρον = any linear feature in an organism, so sinew, tendon, nerve, fibre in plants; in entomology used for wing veins; for *-themis* ≈ libellulid dragonfly see *Lyriothemis* above.

By this genus name Brauer replaced the preoccupied name *Polyneura* Rambur (Gr. πολὺς = many, much) referring to the many wing veins in this genus.

Nososticta Hagen in Selys, 1860: 456

Gr. νόσος = disease + στικτός = spotted, tattooed which, in the Odonata, often refers to the pterostigma.

The name is enigmatic, as an indication what it should mean is neither given in the original description for the genus nor in that for the species *N. solida* on which it was based.

Orolestes McLachlan 1895: 21

Gr. ὄρος = mountain, hill; for *-lestes* see p. 38

McLachlan does not explain his choice of the name; but he based this lestid genus on a single species from Darjeeling (India), a region situated in the Lower Himalayan Range at 2000 metres. This species (*O. selysii*) has "median dark bands on the wings", which

“on the wings of *Agriona* is very rare, and is probably seen in a less intensified degree only in some species of *Chlorolestes* and *Disparoneura*” (p. 23).

Pornothemis Krüger, 1902a: 163 (Fig. 15)

Gr. πόρνος = fornicator or πόρνη = harlot, prostitute; for *-themis* ≈ libellulid dragonfly see *Lyriothemis* p. 38

Krüger does not explain his choice of the name; for his time the chosen name seems to be somewhat indecent. Beolens 2018: 229 suggests it might refer to a feature of the male: “Genitalien vortretend [genitalia protruding]”. That would not be isolated in nomenclature, as Brauer (1878: 196) had established a genus *Orchithemis* [= testicle *Themis*] due to the special form of the male genitalia (see Fliedner 2020: 10) or Selys (1878b: 310) had named a species *priapea* in an allusion to Priapus, the ithyphallic god of gardens (see p. 23 s.v. *dau*). But a name referring to a human perpetrator of sexual assaults to my knowledge is unique in odonatological nomenclature.

If the name was intended to evoke a charming female being (cf. *Copera* p. 34; Fliedner 2021: 111) that rather would be a misnomer as the Greek word is somewhat derogatory.

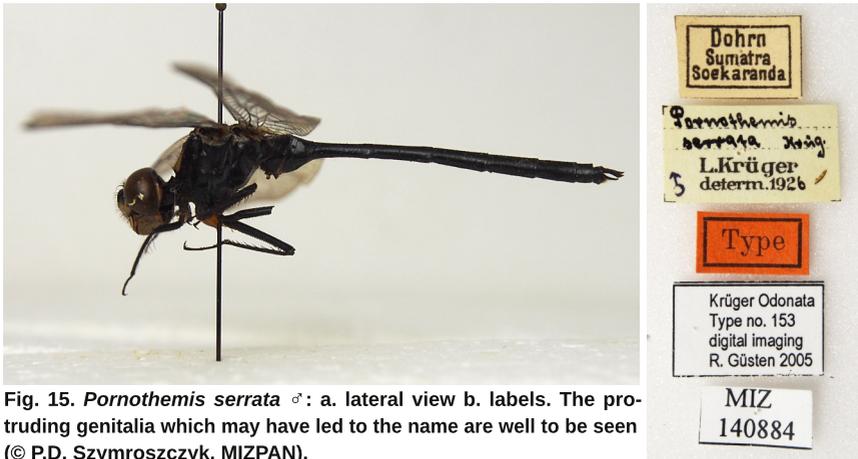


Fig. 15. *Pornothemis serrata* ♂: a. lateral view b. labels. The protruding genitalia which may have led to the name are well to be seen (© P.D. Szymroszczyk, MIZPAN).

Prodasineura Cowley, 1934a: 202

Selys (1860: 441 & 446) in his 'légion *Protonevra*' had named a "genre" and within that a "sous-genre" with the preoccupied name *Alloneura* (= differently veined) and had redefined it in 1886 (pp. 159; 176). Cowley removed the taxonomical disarray (for the taxonomical difficulties see Cowley 1934a: 202-204) by replacing *Alloneura* Selys 1886: 176 by the name *Prodasineura*. This replacement name is an anagram (a word formed by rearranging the letters) of another "sous-genre" of *Alloneura* 1860 named *Disparoneura* with which (according to Selys 1886: 177) *Prodasineura* has a feature of the wing venation in common. The genus *Disparoneura* (≈ separately veined, from *L. dispare* = to separate + Gr. νεύρον = in entomology used for wing veins) got its name because of this: "Secteurs de l'arcus naissant séparés [Sectors of the arcus originating separately]" (Selys 1860: 443).

Rhinagrion Calvert 1913: 258

Gr. ῥίς (stem ῥιν-) = nose; for *-agrion* see *Aciagrion* p. 32

Calvert (1913: 258) explains in foot note 91: "The name *Amphilestes* Selys is preoccupied by *Amphilestes* Owen (Encyc. Brit., 8th edit., XVII, p.157, 1859) for a fossil mammal. *Rhinagrion* is suggested by de Selys' emphasis of one of the characters of his *Amphilestes* as "Tête robuste, à épistome saillant [Head robust, with a protruding clypeus]"

Rhinocypha Rambur, 1842 : 232

Gr. ῥίς (stem ῥιν-) = nose + κυφός = bent forwards, hunchbacked

The species of this genus have a protruding clypeus. That applies also to others of the 14 related genera the names of which end in *-cypha*, six of which contain but one species. These now are placed in the Chlorocyphidae.

Risioptionia Cowley, 1934a: 204

Gr. φλέψ (stem φλεβ-) = artery, vein + feminine form of the adjectival suffix -ιος -ία -ιον = related to, associated with

The Swiss odonatologist F. Ris (1909a: 18 & 61) had established a genus *Oda*, which Germanic name means something like 'owner or heiress of property'. But Cowley seeing that this name was preoccupied in mollusca replaced it by *Risioptionia* combining the name of the author of the original taxon, who had died not long before, with *-ptionia*, an element in odonate genus names introduced by Selys in 1854: 81 as a reference to a special feature of wing venation in the respective genus. This element he might have chosen, because the species *R. dohrni*, on which Ris had based his new genus, had been transferred from the genus *Nannoptionia*. That genus name Selys (1878b: 315) had combined from his genus *Neoptionia* (= veined in a novel way, a younger synonym of *Tetrathemis*) with *Nannophya* Rambur (= dwarfish stature, a genus created for the smallest dragonfly he knew), with which taxon Selys saw some corresponding features of wing venation in the new genus.

Sieboldius Selys 1854: 83

Selys based this genus on a single species which he thought to be from Japan (see p. 40 s.v. *grandis*), but did not explain after whom it was named. But that explanation is found in Selys 1858: 504, where it reads: "L'habitat et le système de la coloration si différents m'ont cependant décidé à la présenter comme formant un sous-genre particulier, que j'ai dédié à M. Von Siebold, l'illustre explorateur de la Faune et de la Flore du Japon [The habitat and the type of coloration which are so different {from *Hagenius* named after his friend H.A. Hagen at the same time} induced me to introduce this taxon as a subgenus by its own, which I have dedicated to Mr. von Siebold, the famous explorer of Japan's fauna and flora]." Franz von Siebold (1796-1866), a physician and naturalist who went to Japan in Dutch service, collected lots of botanical, zoological and ethnological material about which he wrote in numerous publications after having been banned from Japan (for more see Beolens 2018: 384-385).

Sundacypha Laidlaw, 1950: 272

Sunda see below; for *-cypha* (a reference to the related genus *Rhinocypha*) see p. 40

Sunda was a Hindu kingdom, which existed from the seventh to the sixteenth century

in the west part of Java. After this the Sunda islands got their name whereas with the exception of Java they were not inhabited by Sundanese people. Later on it was recognised that during the last glacial period Malaysia, Sumatra, Java, Borneo and adjoining islands (e.g. Palawan) up to the Wallace line formed one large landmass. From this Laidlaw obviously derived his new genus name for *Rhinocypha petiolata* (Selys, 1859), which is found in Malaysia, Sumatra and Borneo, combining it with *-cypha* as a reference to the Chlorocyphidae, to which the taxon pertains. The reason for establishing the genus was the longer petiolation of the wings compared to *Rhinocypha*. Not until 1999 was another species of *Sundacypha* described (Orr 1999).

Tetrathemis Brauer, 1868: 182

Gr. τετρα– (in compounds) = four; for *-themis* see *Lyriothemis* p. 38

This was one of the first *-themis* names established by Brauer for a libellulid genus. The name refers to an irregularity concerning the wing venation. In this genus in both wings the anterior side of the triangle is bent, so that the discoidal cell is four-sided.

Conclusions

Krüger's contribution to odonatological nomenclature does not seem very important as he named just one genus and 43 species, of which 22 are now recognised as synonyms; of the other names 17 appertain to species and 4 to subspecies; but as his dragonfly publications focus on one region, to the knowledge of its fauna his treatises contributed rather much, in their time they were sufficiently important, whereas their significance by no means reaches that of Lieftinck's studies concerning the dragonflies of the Sundan region.

His only genus name probably refers to a morphological characteristic of the only species attributed to this taxon by the author.

Of Krüger's 43 species group names (synonyms included) the largest group are eponyms (18). Of these seven refer to the collectors of the specimens four of which are dedicated to his patron Heinrich Dohrn, of the others one to an indigenous gatherer (see p. 22 s.v. *arba*), another one to Dohrn's preparator (p. 30 s.v. *udeanus*), the last one to the collector and trader H. Fruhstorfer (p. 25). Another seven taxa were dedicated to the leading odonatologists of his time, of whom he had been in contact only to McLachlan (cf p. 18) and Martin (cf p. 19) and – not in relation to Odonata - to Karsch (cf. p. 26). So it seems to me that by these dedications he primarily wanted to show his reverence to the eponyms because of their eminence in science. A personal touch show the dedications to his late academic teacher A. Gerstaecker (1828-1895), who had also published on Odonata and Neuroptera, and to his companions in hiking, who had helped him to collect dragonflies for the Stettin collection (see *dau* p. 23 and *laur* p. 27). A last one is a female name from antiquity (*lara* p. 18).

16 names pertain to appearance, of these six to morphology and five to coloration, two to pattern and to size each, one shows Krüger's doubt about the classification (see p. 30 s.v. *variabilis*).

7 species were named after their provenance, but not very instructively, as five of them are called *sumatranus* or *sumatrana*, one *borneensis* and another one *sundana*. Only two of these are not synonyms.

Krüger's last two species names refer to similarity with other taxa.

It might be of interest to compare these proportions with those of the species group names by Brauer and by Ris (cf. table 1). As these authors had to find many more names, among theirs the percentage of recent scientists or collectors is certainly much lower, that of names from antiquity or literature plays a major role. Also the choice of the odonatologists differs between Krüger and Ris: while the former solely chose acknowledged scientists of the older generation (Selys, Hagen, Gerstaecker, Brauer, Mc Lachlan, Kirby, Martin, Karsch) half of Ris' eponym odonatologists pertain to the younger generation (Laidlaw, Williamson, Le Roi, Tillyard, Er. Schmidt), and it might be mentioned that Krüger in his neuropterous studies on Hemerobiidae again named six genera after scientists of the older generation (Wesmael, Schneider, Hagen, Brauer, Mc Lachlan, Reuter) of which only two taxa are still valid (see p. 45).

In Krüger's names appearance takes the second place and within this morphology prevails over coloration. With Brauer and Ris where most names pertain to appearance it is the other way round. It is to be noted that more often Krüger applied identical names in different genera (*sumatranus*-a 5x; *dohrni* 4x; *gracilis* 2x {11 of 43}) while In Brauer we find only one iteration (*lestoides* 2x; that the name *rosenbergi* is found twice is caused because one of them was taken over from Kaup {2 of 105}). Among the names by Ris we find 5 that are iterated; three of them are dedications to merited collectors (Joergensen; Sauter) and to his friend Morton, the others are *silvarum* and *peruviana* {10 of 281}.

We will also have a look at the 50 genus group names (16 still valid) and the 43 species group names (13 still valid) Krüger suggested for Neuroptera. Of the genus group names

Tab. 1. Number of species group names by category.

Species group names	Authors					
	Krüger		Brauer'		Ris''	
total	43		105		281	
eponyms	18	(41.9%)	9	(8.6%)	102	(36.2%)
*odonatologists	8	(18.3%)	-	-	10	(3.6%)
*collectors/donors	7	(16.3%)	5	(4.8%)	39	(13.2%)
*friends/family	2	(4.7%)	1	(0.95%)	1	(0.4%) ¹
*from antiquity/literature	1	(2.3%)	3	(2.9%)	42	(14.9%)
appearance	16	(37.2 %)	73	(69.2 %)	144	(51.2 %)
*morphology	6	(14.0%)	22	(21.0%)	34	(12.1%)
*coloration	5	(11.2%)	16	(15.2%)	65	(23.1%)
*pattern	2	(4.7%)	13	(12.4%)	17	(6.0%)
*size	2	(4.7%)	7	(6.7%)	6	(2.1%)
*similarity to other taxa	-	-	11	(10.5%)	17	(6.0%)
*beauty	-	-	4	(3.8%)	5	(1.8%)
*doubt	1	(2.3%)	-	-	1	(0.4%)
toponyms	7	(16.3%)	13	(12.4%)	36	(12.8%)

^{*} cf Fliedner 2020: 46; ^{**} cf Fliedner 2021: 120-122 (names taken from other authors excluded)

¹ only a friend from university is incorporated here; his helpers at Brussels could also have been listed here. Odonatological friends are included in the rubric 'odonatologists'

29 pertain to appearance, and within these 11 to similarity to other taxa, 8 to pattern and 7 to morphology, none to coloration; 11 reflect evolution (of these, 8 pertain to fossil taxa), 6 are eponyms (cf above), 4 refer to provenance directly or indirectly. His choice of the 43 names for species differs significantly from this: 20, that means nearly half of these, refer to provenance, 17 refer to appearance; of these 8 reflect pattern, 3 coloration, 2 morphology and size each, just 1 is related to evolution. The eponymous species are dedicated to the late collector of some species included in amber, which Krüger treated in his respective publication (1923b), and to the collector of the type specimen at the Stettin collection, and the last one to Edmund Schmidt, conservator at the museum, who in 1906 had dedicated a hemipteran species collected by Dohrn in Sukaranda to Krüger (only short of the last turn of the century that species turned out to be a younger synonym, see Liang 1997: 224).

The major proportion being evolution and similarity to other taxa in Krüger's neuropterous genus names might reflect his scientific approach which will be discussed later. That the countries from where the type specimens originated prevail in the species names might also be intended to show the distribution of the genera to which they belong (cf. table 2).

Also in Krüger's neuropterous taxa there is a tendency to apply identical names in different genera (*sumatranus* 2x; *parvus* 2x; *signatus* 2x {these names are also found in his odonate species}; *javanus* 2x {8 of 43}).

Category of name	Genera		Species	
total	50		43	
eponyms	6	12%	3	7.0%
* odonatologists	6	12%	1	2.3%
* collectors/donors	0		2	4.7%
* friends/family	0		0	
* from antiquity/literature	0		0	
appearance	29	58%	17	39.5%
* morphology	7	14%	2	4.7%
* coloration	0		3	7.0%
* pattern	8	16%	8	18.6%
* size	0		2	4.7%
* similarity to other taxa	11	22%	0	
* beauty	3	6%	1	2.3%
* doubt			1	2.3%
toponyms	4	8%	20	46.5%
evolution	11	22%	1	2.3%
*fossil	8	16%	1	2.3%
uncertain			2	4.7%

Table 2. Krüger's names for Neuroptera categorised.

This is not the place for a detailed account of Krüger's achievements in the neuropteran taxonomy. That task would require a neuropterological specialist. Here only some impressions will be proffered gained from Krüger's treatises and some recent publications (Aspöck et al. 2001; Aspöck & Aspöck. 1980; Aspöck & Aspöck, 1981; Aspöck et al. 2017; Monserrat 1986; Monserrat 1990; Wichard et al. 2016; Winterton et al. 2017; Winterton et al. 2019)

Krüger was convinced of the Darwinian concept of evolution. So he based his classification of Neuroptera on Handlirsch's treatise which started from fossil forms to systematise the recent families (cf. Handlirsch 1906-1908: 1292) and he kept to it in all his studies on Neuroptera. But already in his paper on *Neurothemis* he had based his taxonomic decisions on an assumed phylogenetic development (cf. Krüger 1903: 255-56; 262; 268). He diligently adopted the system of wing venation by Comstock & Needham and criticised scientists who did not. So in his neuropterous publications he gave elaborate descriptions of the wing venation of all the taxa he had at hand, and tried to supplement these for others from literature. How efficiently he treated the respective neuropterous families depended upon the material and the literature available to him.

So for the large family of *Myrmeleontidae* he just gave a redescription of *Myrmeleon formicarius* with an accent on wing venation and added some information about its differences to that of other genera (Krüger 1916).

In the Psychopsidae he skipped the four genera erected by Navas in 1910 and 1914 because he took them not to be sufficiently founded (Krüger 1922a: 39) trying to replace two of them by names of his own. But he also synonymised two taxa from their first descriptions with *Silveira marshalli* (McLachlan).

In the Berothidae he took into account five of the nine genera described so far [he omitted the genus *Ormiscocerus* Blanchard 1851 following Banks who had placed it in the Polystoechotini (Krüger 1922b: 55) and three genera described by Tillyard in 1918 escaped his notice probably due to the lack of exchange of scientific publications during World War I]. The two genera he added in this family turned out to be younger synonyms, but he is author of two berothid species.

In the Sisyridae beginning with a thorough description of the wing venation of the first described species *Sisyra nigra* (Retzius, 1783) he summed up the three genera and all the species described so far but did not add any taxa of his own. In his paper he included also the genus *Nevrorthus* Costa 1863 and the extinct genus *Rophalis* Hagen, 1856 which later were placed in the family Nevrothidae. However in this paper Krüger stated that he had not had access to the most recent publications thus alerting his readers to look for additional information (Krüger 1923a: 64).

Treating the Neuroptera in Baltic amber from the museum in Danzig (today's Gdansk) he described anew the species already known (5; the specimen of a sixth one was missing) focusing on their wing venation (1913a: 31; 1913b: 226; 1923b: passim). He added three new species and distributed the others and these into seven new genera, of which two turned out to be younger synonyms within the last five years (Makarkin et al. 2016; Makarkin et al. 2021).

When treating the Osmylidae he added ten species and 23 new genera, of which merely nine were maintained; this is already mentioned above (p. 11).

Also in his paper on Hemeroibiidae (1922c) to the two known subfamilies Krüger added three new ones (now five additional ones are recognised) and in addition to the ca ten genera established until then (of which he omitted three, one authored by Banks, two by Navás) Krüger named 18 new ones distinguished by minute differences in their wing venation. Most of these he based on one or more of his 26 new species that were still to be described in a second part of the treatise which however never was published. As a result in Monserrat

(1990) nearly all these taxa are treated as *nomina nuda*; else they are seen as synonyms of the taxa from which Krüger wanted to differentiate them (see Aspöck et al. 2001: 124-162). So of Krüger's hemerobiid genera only *Wesmaelius* and *Brauerobius* which each were based on a species already described are still valid, the latter one as a subgenus (l.c. 136). For neuropterological science a proper publication of these new hemerobiid species would certainly have been an important contribution, even if several of Krüger's new genera would probably have been synonymised with each other or with those of other authors later on. Accordingly in contrast to his high aspirations Krüger's contribution to the taxonomy of this family is rather small.

What made him generate so many new taxa in the Osmylidae and Hemerobiidae might be seen from a remark in Krüger 1915b: 61, where he criticises Banks for not observing taxonomical categories sufficiently: "Nun wäre es ja im Grunde höchst gleichgültig, ob eine Verwandtschaftsgruppe mit Tribus, Unterfamilie, Familie oder Überfamilie bezeichnet wird und auch die Benennung auf *ini*, *inae*, *idae* könnte uns kalt lassen. Aber bei den Neuropteren als einer untergehenden Insektengruppe von sehr hohem Alter, von höherem Alter als andere heute in so zahlreichen Arten vertretene Ordnungen, ist der Verwandtschaftsgrad bei den noch bestehenden Gattungen kein so naher, daß man ihrer viele in eine Tribus oder Unterfamilie stecken kann; vielmehr ist die Zahl der ausgestorbenen Zwischenglieder bereits so groß, daß vielfach nur noch einzelne Gattungen die so sehr zusammengeschrumpften Familien darstellen. Banks stellt daher ganz heterogene Elemente sogar zu Triben und Unterfamilien zusammen. [Now it would be in principle highly indifferent whether a kinship group is designated with tribe, subfamily, family or superfamily and also the designation on *ini*, *inae*, *idae* could leave us cold. But with the Neuroptera as a declining insect group of very high age, of higher age than other orders represented today in so numerous species, the degree of relationship with the still existing genera is not such a close one that one can put many of them into a tribe or subfamily; rather, the number of extinct intermediate members is already so large that in many cases only single genera represent the families that have shrunk so much. Banks therefore puts together quite heterogeneous elements even to tribes and subfamilies]."

So we can see that Krüger by his many genus names wanted to illustrate fine evolutionary differences of which he had convinced himself.

But, as from the much fewer number of valid taxa attributed to Krüger can be seen, this conviction was not shared by all scientists. So already Ris in his treatment of *Neurothemis* (1911: 550), whereas he described that paper as "sehr verdienstliches Werk [highly meritorious treatise]" which had helped to overcome some difficulties of classification, criticised: "Verfehlt scheint mir bei Krüger die theoretisch-phylogenetische Betrachtungsweise, die mit zu vielen Unbekannten operieren muss [It seems to me that Krüger's theoretical-phylogenetic approach, which has to operate with too many unknowns, is mistaken]" and Nakahara (1966: 206-07) assessing "Krüger's ultra-minute venational classification" stated: "However, it is useless now to inquire into Krüger's highly artificial system, a strict adherence to which infrequently produces situations where opposite wings of one and the same individual have to be referred to different genera."

Thus, lack of acceptance towards his methodological approach may have led to the effect that Krüger's promised continuation of the Hemerobiidae (1922c: 172), the additions to

the other families of Neuroptera (1923a: 64) and a treatise on the Nymphesidae (1922c: 138) never were published. For in 1914 there had been an amendment of the statutes of the Stettiner Entomologischer Verein that for any article that should be published in the "Entomologische Zeitung" the decision of a commission of four was necessary, in which Krüger, even though being editor of that periodical, had just one vote (Wilfert et al. 2016: 180). If this guess is correct that might be the real reason why Krüger completely retired from the activities of the society after he had given up the presidency.

So an overall impression on Krüger's studies of Neuroptera is: His method of giving an historical survey of the definition of the order and of each family he attended to certainly was very useful at his time as were his thorough descriptions of the wing venation following the system of Comstock & Needham. Also in his sorting the known material into new sub-families he seems to have been seminal. But his conviction to have perfectly penetrated the evolutionary system made him overbearing in his attitude to other scientists whom he criticised harshly (e.g. Banks, Navás, Nakahara). Perhaps that resulted from his role as a teacher in a hierarchic system, members of which liked to feel omniscient.

Concerning his connection with other odonatologists, little is known except what Krüger himself described in his papers. Due to the extensive destruction of Stettin in World War II there is little hope that more information on his contacts will be found there. Perhaps a research in the archives of major collections might produce letters by him which could shed some light on this matter.

Aside from the advice by R. McLachlan and R. Martin mentioned above (p. 18-19) also with E. de Selys a correspondence came about by his publications on Sumatran Odonata. In Krüger's obituary (1901: 217) after an enumeration of major odonatologists who were in close connection to the 'Father of odonatology' it reads: "Auch ich erfreute mich seines Wohlwollens, und innige Freude empfand ich beim Lesen seines ersten Briefes an mich. Er verfolgte meine Odonaten-Studien mit warmem Interesse [I, too, enjoyed his benevolence, and I felt intimate joy when I read his first letter to me. He followed my Odonata studies with warm interest]."

Krüger's contact with R.B. Williamson is documented by offprints of his odonatological papers in the archives of UMMZ with a personal dedication note (see fig. 16 p. 47) and by specimens of Odonata from North America in the "Krüger Collection" (see p. 50).

Odonate species were dedicated to him by R. Martin and by F.F. Laidlaw (cf. Hämäläinen 2016: 69; Beolens 2018: 228). The dedication by Martin (1904: 216) probably was made in return for the taxon named after himself by Krüger in 1903 who had received his type specimen from the eponym. The *Drepanosticta* species dedicated to him was assessed by Laidlaw to pertain to the same taxonomic group with Krüger's *D. sundana* (1926: 229).

Also the knowledge about his relations to other entomologists is scanty. His correspondence with Esben-Petersen and Nakahara was already mentioned (p. 11).

That he was in contact with Walther Horn (1871-1939), director of the Deutsches Entomologisches Museum then located at Berlin-Dahlem, we know from the dedication of the portrait photo (fig. 1 p. 2). Perhaps the contact came about when Krüger received the specimens from there collected by H. Sauter on Taiwan, from which he described *Iso-scelipteron formosense* (see Krüger 1922b: 66).

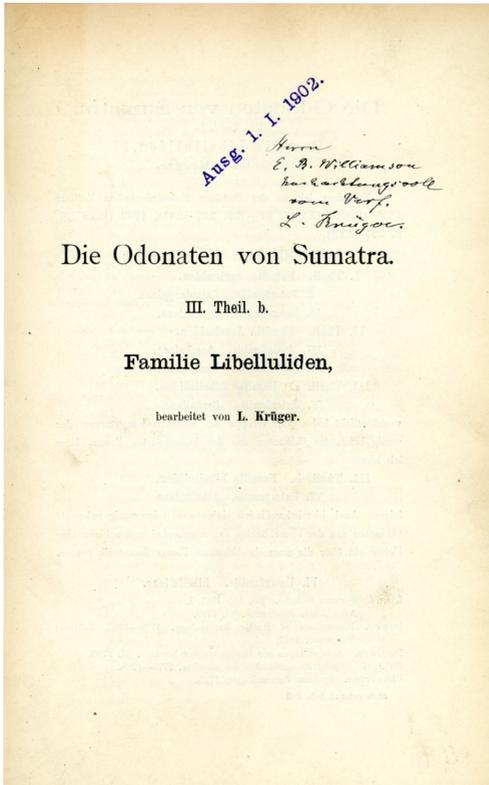


Fig. 16. Offprint of Krüger 1902a, title page with a dedication to E.B. Williamson: “Herrn E.B. Williamson hochachtungsvoll vom Verf(asser) L. Krüger [To E.B. Williamson respectfully by the author L.K.]”. The stamp mark “Ausg(ang) 1.I. 1902” means “sent on Jan. 1st 1902”. (UMMZ archives; photo kindly provided by Rosser Garrison).

Neuropterous taxa dedicated to him are *Spilosmylus kruegeri* (Esben-Petersen, 1914: 270) and the genus *Lekrugeria* Navás, 1929 (cf. Aspöck & Aspöck 1985). In spite of having been criticised harshly by Krüger, Navás appreciated Krüger's investigations on the Berothidae (1929: 40): “En obsequio del Dr. Leopoldo Krüger, que ha ilustrado no poco fa familia de los Berótidós [In honour of Dr Leopold Krüger, who has contributed considerably to the knowledge of the berothid family].” (N.B.: The myrmeleonid species *Novoheus kruegeri* Navas, 1930 is not dedicated to Leopold Krüger but to an entomologist named Georg Krüger).

Nusalala kruegeri, which Nakahara (1965: 113) named after him because he was convinced that it was the same taxon that Krüger had intended to dedicate to Ed. Schmidt (see next paragraph), presently is seen as synonym of *Nusala irrebita* (Navas, 1929) (see Oswald 1993: 251).

Krüger's acquaintance with Edmund Schmidt from his work at the “Stettiner Museum” that led to the dedication of a hemipteran species to him was referred to above (p. 43). Until his conscription to the army in World War I Schmidt for some time also had been with Krüger on the steering committee of the “Stettiner entomologischer Verein” and he earlier had collected the type specimen of *Paryphosmylus ornatus* Krüger in Ecuador. Krüger's intended dedication of a South American hemerobiid species to Schmidt (1922c: 171;

probably collected by the envisaged eponym) had no effect as Krüger never had published its description (cf. p. 45).

One might wonder why Krüger, having won some renown internationally by his odonatological publications, returned to that field of entomology only for the paper that was intended to introduce its readers to odonatology focused on the Pomeranian fauna, not as a contribution to advanced studies. The answer probably is: Krüger saw the study of dragonflies as a firmly established branch of entomology, with successful top scientists such as Martin, Ris, Calvert, Laidlaw or Tillyard as the most important representatives. While fundamental knowledge was still to be gained in neuropterology, he was confident of being able to make a lasting contribution to this in spite of being restricted to Stettin and limited in his scientific activities due to his professional duties.

Considering Krüger's intention in his work, we may see his permanent aspiration to disseminate trusted knowledge of biological interrelations and facts. He wrote about this aim in his school program (1906) and being head of the 'Stettiner Entomologische Gesellschaft' he instituted lectures and demonstrations also for the non-academic members of the society (see p. 9). In his neuropteran papers and that on the Odonata of Pomerania (Krüger 1925d) he always gave a profound historical introduction on their subjects and on wing venation so that his following statements might be understood well. Also that in his papers on Osmyliidae he explained the meaning of all the scientific names, also those of other authors, is in accord with this endeavour. Such explanations were not common in German scientific literature then and might have been motivated by the fact that he had not learned Greek at school and probably it had not been easy for him to gain that knowledge himself. Also in his scientific names he did not always use the correct endings in connection with genus names ending in *-ma* which are neuter in gender.

This aspiration to make scientific achievements available to others would be in accordance with his professional role as a teacher. But he also tended to criticise harshly if other scientists were not in accord with his opinions. That might have been a negative result of his professional conditioning as well.

It is to be regretted that he could not complete his work on Neuroptera. Issues of evolution on which he focused are still at large in modern research (for example Garzón-Orduña et al. 2016 or Winterton et al. 2019) and he would have been thrilled by the results on age and divergence times of the respective families won by gene sequencing in addition to morphological methods based on wing venation and genital organs. That means: his results in odonatology and neuropterology added to the knowledge of species and systematics and were advanced in his time but they were overhauled later due to new insights as is common in science.

The entomological collection of the 'Stettiner Entomologischer Verein' ("Krüger-Collection")

Krüger's odonatological descriptions were based on the collection of the 'Stettiner Entomologischer Verein'. So it seems appropriate to add some words about what became of it after Krüger's death. Unfortunately, a contribution on this topic from the Museum and Institute of Zoology of the Polish Academy of Sciences (MIZPAN) did not come about, as the

archive is currently packed for an upcoming move and the relevant documents are therefore not accessible (P.D. Szymroszczyk, by e-mail).

From 1913 that collection, which never was owned by Krüger, but for about thirty years was curated by him, had its location in the "Museum auf der Hakenterrasse". In the 1920s it passed into possession of the municipality of Stettin, which also owned the museum, in return for supporting the entomological society financially during the hyperinflation.

After World War II the Allied Powers decided that the river Oder should be the new border between Poland and Germany. But in July 1945 the Soviet Union decreed, that also Stettin on the west bank of the river and some of its surroundings should be given to Poland.

As during the war the center of Stettin was ninety percent, its outer parts seventy percent, destroyed by bombardments the fate of the collection for some time was unknown. But fortunately the museum building had remained nearly unscathed and its natural history collections had been safely stored in the museum basement or in the Stettin saving banks vault. So there were few losses.

They were diligently transferred by the Polish government to a location near Warsaw and placed in the charge of the Polish Academy of Science the scientific collections of which had been destroyed in World War II. That became known in Germany from a publication of Paweł Buczyński (2004) analysing several collections in the Museum and Institute of Zoology of the Polish Academy of Sciences (MIZPAN) about the occurrence of dragonflies in which he used the "Krüger-Collection" for data from Pomerania which before World War II had pertained to Germany.

To investigate what had become of Krüger's types in the collection R. Güsten went to the museum in the context of a project by the European science program SYNTHESIS and IDF at the end of November 2005. From his interim reports to IDF the following can be concluded:

The collection then was located in buildings erected about 1970 for the collections of the Polish Academy in a marsh forest about 25 kilometres north of Warsaw which at that time were somewhat confined, but additional space in a new storeroom was soon to be ready for occupation. The odonates of the "Krüger Collection" were housed in three cabinets. On top of these were glass drawers which contained additional papered specimens (not from type series) most of which severely were damaged by museum pests. In the cabinets the specimens were in a better condition, but the bottoms of some of the drawers were in danger of falling out.

Of the 43 taxa described by Krüger originally there were 173 primary types (all holo- or syntypes) in the collection, most of them gathered by H.Dohrn at Sukaranda.

Of these Güsten found 120 at the MIZPAN. Two species were completely missing. Of one its labels were placed vertically, indicating no specimens were found when the collection was arranged more densely packed, probably just before or after movement from Stettin (Szczecin) to Warsaw. For the lack of that species he did not find an explanation. The other missing species originally had been accommodated in about three drawers which are actually lacking (near the end of the "Aeshnidae" sensu Krüger). Of the approximately 10 more or less damaged type specimens, 5 or 6 were already indicated with this condition in the Krüger publications.

Concerning the about 50 syntypical specimens not present at the MIZPAN, Güsten found out that most of them presently are in the Collection Selys in the Royal Belgian Institute of Natural Science (RBINS) at Brussels. That means: Krüger (or Heinrich Dohrn) had taken them from a longer series of syntypes and sent them to Selys to complement his collection, which shows that that connection was closer than to be seen from Krüger (1901). According to a preliminary list by W. Dekoninck, there is a total of 36 specimens from 17 species named by Krüger in the Selys Collection, of which a maximum of 27 can be from the "Krüger Collection"; but in it neither the localities are mentioned, from where the specimens came, nor by whom they were collected. It is therefore not possible to deduce with certainty from this list how many specimens can actually be traced back to that stock.

According to information from V.J. Kalkman typical specimens of four species named by Krüger have come to the Naturalis Biodiversity Center Leiden [*Heliaeschna crassa* holotype (see p. 14-15), *Gynacantha kirbyi* holotype (see p. 18), *Rhinocypha hageni* syntype (see p. 16-17) and *Idionyx dohrni* lectotype (see Lieftinck 1971: 84)]. Perhaps those specimens were given to Lieftinck when he visited the collection at Stettin probably in connection with his preparations for the publication on the Odonata of Sumatra (1935) which visit is to be seen by specimens identified by Lieftinck (e.g. *Amphicnemis gracilis* syntypes MIZPAN no. 243 and 244).

For those who want to get a better picture of which Odonata species are presently in the "Krüger Collection" there is an opportunity: Since 2017 there has been a catalogue of the ca 4300 specimens on the internet (Mierzwa 2017) of which a large part of the exotic species was collected by Heinrich Dohrn from 1893 to 1897 in Sumatra; but also plenty of species from other parts of the world are present there. Many of the taxa have been identified by Krüger; regrettably only for about a tenth of the collection there is an accession date, but not often information about the collector. Nearly always however a provenance is given. So if someone takes a closer look he will find that about 50 specimens originating from 'France' have as place of origin 'Le Blanc' and are said to be a 'present'. So one can conclude that these were given by René Martin, who lived there until 1908 and that they are a sign of the close relations between him and Krüger. A more thorough search perhaps might also lead to specimens donated by Selys. At least one specimen of *Stylurus scudderii* (p. 6, no. 3769) shows that Odonata also were received from E.B. Williamson.

It is strange that not a single specimen in that catalogue has the provenance 'Germany'. If one looks for the direct place where specimens of European species were caught one will find among others 'Uckermark; Lychen', a place 100 kilometres west of Stettin/ Szczecin, or 'Flensburg', a town near the Danish border or 'Berchtesgaden', a municipality near the border of Austria; but they all are said to be from 'Gambia', where none of these species occur, and there is a map of the West African state atop. From 'Berchtesgaden' in 'Gambia' also the neotropic species *Cordulegaster godmani* Mc Lachlan is registered (p. 31, no. 799), which taxon was described from Costa Rica. As somewhere in the list however several exotic species are said to be from Sweden, in such cases perhaps the residence of the donor erroneously is given as the location wherefrom the specimen came.

But such mistakes might easily be rectified in this useful catalogue.

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References

Resources used in eliciting etymologies

- Ahrens, G., 1988. Medizinisches und naturwissenschaftliches Latein: mit latinisiertem griech. Wortschatz. Leipzig, Verlag Enzyklopädie. 353 pp.
- Bridges, C.A., 1994. Catalogue of the family-group, genus-group and speciesgroup names of the Odonata of the world. Urbana, Illinois, C.A. Bridges. 3rd Edn xiv + 951 pp.
- Hentschel, E. & G. Wagner, 1993. Zoologisches Wörterbuch. 5. durchgesehene Auflage. Jena, Gustav Fischer (UTB 367). 576 pp.
- Lewis, C.T. & C. Short, 1963. Latin Dictionary Based on Andrews's edition of Freund's Latin Dictionary. New York, Oxford University Press. 2019 pp.

Liddell, H.G & R. Scott, 1996. A Greek Lexicon-English. 9th ed with a revised supplement. Oxford, Clarendon Press. 2111 col.

Werner, F.C., 1972. Wortelemente lateinisch-griechischer Fachausdrücke in den biologischen Wissenschaften. Frankfurt/M., Suhrkamp (Suhrkamp Taschenbuch 64). 475 pp.

References containing original descriptions or explanatory matter

Anonymous 1938. Die Festsitzung zum 100jährigen Bestehen des Entomologischen Vereins zu Stettin. Stettiner Entomologische Zeitung 98: 314-318.

Aspöck, H., Hölzel, H. & U. Aspöck 2001. Kommentierter Katalog der Neuropterida (Insecta: Raphidioptera, Megaloptera, Neuroptera) der Westpaläarktis. Denisia 2: 1-606.

Aspöck, U. & H. Aspöck 1980. Das Genus *Isoscelipteron* Costa 1863 (Neuropteroidea: Planipennia: Berothidae). Zeitschrift der Arbeitsgemeinschaft Österreichischer Entomologen 32 (1/2): 65-74.

Aspöck, U. & H. Aspöck 1981. Weitere Untersuchungen an Berothiden: *Berotha* Walker, *Isoscelipteron* Costa 1863 und *Asadateva* n.g. (Neuropteroidea: Planipennia). Zeitschrift der Arbeitsgemeinschaft Österreichischer Entomologen 33 (1/2): 1-14.

Aspöck, U. & H. Aspöck 1985. Das Genus *Lekrugeria* Navás (Neuropteroidea: Planipennia: Berothidae: Berothinae). Zeitschrift der Arbeitsgemeinschaft Österreichischer Entomologen 37 (3/4): 85 - 98.

Aspöck, U., Aspöck, H. & X. Liu 2017. The Nevrothidae, mistaken at all times: phylogeny and review of present knowledge (Holometabola, Neuropterida, Neuroptera). Deutsche Entomologische Zeitschrift NF 64: 77-110.

Belle, J. 1984. *Nothodiplax dendrophila*, a new genus and species from Surinam (Odonata, Libellulidae). Entomologische Berichten 44 (1): 6-8.

Beolens, B. 2018. Eponym Dictionary of Odonata. Dunbeath, Caithness Scotland UK, Whittles Publishing Ltd. 460 pp.

Brauer, F. 1864. Erster Bericht über die auf der Weltfahrt der kais. Fregatte Novara gesammelten Neuropteren. Verhandlungen der kaiserlich-königlichen zoologisch-botanischen Gesellschaft Wien 14: 159-164.

Brauer, F. 1867. Beschreibung neuer exotischer Libellen aus den Gattungen *Neurothemis*, *Libellula*, *Diplax*, *Celithemis* und *Tramea*. Verhandlungen der kaiserlich-königlichen zoologisch-botanischen Gesellschaft Wien 17: 3-26.

Brauer, F. 1868. Neue und wenig bekannte vom Herrn Doct. Semper gesammelte Odonaten. Verhandlungen der kaiserlich-königlichen zoologisch-botanischen Gesellschaft Wien 18: 167-188.

Brauer, F. 1878. Über einige neue Gattungen und Arten aus der Ordnung der Neuropteren. Sitzungsberichte der Akademie der Wissenschaften Wien LXXVII, (1): 193-206.

Buczynski, P. 2004. Wążki (Odonata) z Polski w zbiorach Muzeum i Instytutu Zoologii Polskiej Akademii Nauk w Warszawie [Dragonflies (Odonata) from Poland in the collection of Museum and Institute of Zoology of Polish Academy of Sciences in Warsaw]. Nowy Pamiętnik Fizjograficzny Warszawa 3: 15-26.

Burmeister, H. 1839. Handbuch der Entomologie. Vol. II. Berlin, T. C. Friedr. Enslin: 757–1050.

- Calvert, P.P. 1913. The fossil odonate *Phenacolestes*, with a discussion of the venation of the legion *Podagrion* Selys. Proceedings of the Academy of Natural Sciences of Philadelphia 65: 225-275.
- Campion H. 1923. Descriptions of three species of *Notogomphus* (Odonata) from East Africa. Annals and Magazine of Natural History, Series 9, 12 (72): 659–669.
- Carle, F.L., Kjer, K.M. & M.L. May 2015. A molecular phylogeny and classification of Anisoptera (Odonata). Arthropod Systematics and Phylogeny 73 (2) 2015: 281-301.
- Charleton, G. 1677. Exercitationes de differentiis & nominibus animalium. 2nd edition. Oxoniae (= Oxford), Theatrum Sheldonianum. 119 pp.
- Charpentier, T. de. 1840. Libellulinae Europaeae Descriptae et Depictae. Lipsiae, Voss. 180 pp.
- Cowley, J. 1934a. Changes in the generic names of Odonata. Entomologist 67: 200-204.
- Cowley, J. 1934b. The types of some genera of Odonata. Entomologist 67: 273-276.
- Davies, D.A.L. & H. Fliedner 1999. Entomological etymology, a correction (Zygoptera, Megapodagrionidae, Rhipidolestes). Notulae Odonatologicae 5(3): 36-37.
- Davies, D.A.L. & P. Tobin 1985. The dragonflies of the world: A systematic list of the extant species of Odonata. Vol. 2. Anisoptera. Utrecht, Societas Internationalis Odonatologica. xi + 151 pp.
- Dijkstra, K.-D.B., Kalkman, V.J., Dow, R., Stokvis, F.R. & J. van Tol 2014. Redefining the damselfly families: a comprehensive molecular phylogeny of Zygoptera (Odonata). Systematic Entomology 39: 68–96.
- Dohrn, H. 1900. Über schädliche Insekten und ein sachverständiges Urteil. Stettiner Entomologische Zeitung 61: 149-163.
- Dow, R.A., Advento, A.D., Turner, E.C., Caliman, J.P., Foster, W.A., Naim, M., Snaddon, J.L. & S. Ps 2018. Odonata from the BEFTA Project area, Riau Province, Sumatra, Indonesia. Faunistic Studies in Southeast Asian and Pacific Island Odonata 24. 22 pp.
- Dow, R.A., Butler, S.G., Reels, G.T., Steinhoff, P.O.M., Stokvis, F.R. & J. Unggang 2019. Previously unpublished Odonata records from Sarawak, Borneo, part IV: Bintulu Division including the Planted Forest Project and Similajau National Park. Faunistic Studies in Southeast Asian and Pacific Island Odonata 27. 66 pp.
- Dow, R.A. & B.W. Price 2020. A review of *Megalogomphus sumatranus* (Krüger, 1899) and its allies in Sundaland with a description of a new species from Borneo (Odonata: Anisoptera: Gomphidae). Zootaxa 4845(4): 487-508.
- Drury, D. 1773. Illustrations of Natural History, wherein are exhibited upwards of two hundred and forty figures of exotic insects ... vol. 2. London, White. vii + 90 pp., 50 pls.
- Endersby, I. & H. Fliedner 2015. The naming of Australia's dragonflies. Eltham Victoria, Australia, Busbybird publishing. 278 pp.
- Esben-Petersen, P. 1914. Descriptions of a new genus and some new or interesting species of Planipennia. Notes from the Leyden Museum 36:263-270.
- Esben-Petersen, P. 1917. New and little-known Australian Osmylidae. Videnskabelige Meddelelser fra Dansk Naturhistorisk Forening, Kobenhaven, 68, 1–5.
- Fabricius, J.C. 1775. Systema entomologiae, sistens insectorum classes, ordines, genera,

- species, adiectis synonymis, locis, descriptionibus, observationibus. Flensburgi et Lipsiae, Libraria Kortii. xxxii+832 pp.
- Fliedner, H. 2012. Wie die Libelle zu ihrem Namen kam. *Virgo* 15: 5-9.
- Fliedner, H. 2020. The scientific names of Brauer's odonate taxa. *International Dragonfly Fund Report* 148. 55pp.
- Fliedner, H. 2021. The scientific names of Ris' odonate taxa. *International Dragonfly Fund Report* 155. 145 pp.
- Fliedner, H. & I. Endersby 2019. *The Scientific Names of North American Dragonflies*. Eltham Victoria, Australia, Busybird publishing. 274 pp.
- Förster, F. 1897. Beiträge zur Kenntnis der indo-australischen Odonaten-Fauna. VI. *Entomologische Nachrichten* 23: 333-338.
- (Frank, A.B., Goethe, R., Krüger, F. & J. Moritz) 1898. *Die San-José-Schildlaus (Aspidiotus perniciosus Comstock)*. Denkschrift herausgegeben vom Kaiserlichen Gesundheitsamt. Berlin & Heidelberg, Springer. 47pp.
- Fraser, F.C. 1949. A revision fo the Chlorocyphidae with notes on the differentiation of the Selysian species *rubida*, *glauca*, *cyanifrons* and *curta*. *Bulletin de l'Institut Royal des Sciences Naturelles de Belgique* 25(6): 1-50.
- Garzón-Orduña, I.J., Menchaca-Armenta, I., Contreras-Ramos, A., Liu, X. & S.L. Winterton 2016. The phylogeny of brown lacewings (Neuroptera: Hemerobiidae) reveals multiple reductions in wing venation. *BMC Evolutionary Biology* 16 (192). 19pp.
- Hämäläinen, M. 2016. Catalogue of individuals commemorated in the scientific names of extant dragonflies, including lists of all available eponymous species-group and genus-group names – Revised edition. *International Dragonfly Fund Report* 92. 132 pp.
- Hagen, H.-A. 1853. In: Selys-Longchamps, E. de, 1853. *Synopsis des Caloptérygines*. *Bulletins de l'Académie Royale des Sciences, des Lettres, et des Beaux-Arts de Belgique* 20, Annexe: 1–73.
- Hagen, H.A. 1860. In: Selys-Longchamps, E. de 1860. *Synopsis des Agrionines*. *Derniere légion: Protoneura*. *Bulletins de l'Académie Royale des Sciences, des Lettres, et des Beaux-Arts de Belgique (Sér. 2)* 10: 431-462.
- Hagen, H. 1861. *Synopsis of the Neuroptera of North America, with a list of the South American species*. Washington, D. C., Smithsonian Institute. xx+347 pp.
- Hagen, H. 1867. Notizen beim Studium von Brauer's Novara-Neuropteren. *Verhandlungen der kaiserlich-königlichen zoologisch-botanischen Gesellschaft Wien* 17: 31-62.
- Hagen, H.A. 1888. On the genus *Sympetrum*, Newman. *Entomologica Americana* 4: 31-34.
- Handlirsch, A. 1906-1908: *Die Fossilen Insekten und die Phylogenie der rezenten Formen – Ein Handbuch für Paläontologen und Zoologen*. Leipzig, Engelmann. vi + 1430 pp. (issued in 1906, pp. 1–640; 1907, pp. 641–1120; 1908, pp. 1121–1430).
- Illiger, K. 1802. *Namen der Insektengattungen, ihr Genitiv, ihr grammatisches Geschlecht, ihr Silbenmaß, ihre Herleitung; zugleich mit den Deutschen Bezeichnungen*. *Magazin für Insektenkunde* 1: 125-155.
- Jansen, S. 2003. „Schädlinge“. *Geschichte eines wissenschaftlichen und politischen Konstruks*. Campus-Verlag, Frankfurt/Main. 434 pp. [on the competition Krüger won p. 226].

- Karsch, F. 1891. Kritik des Systems der Aeschniden. *Entomologische Nachrichten* 17: 273-290.
- Kirby, W. F. 1889a. A revision of the subfamily Libellulinae, with descriptions of new genera and species. *Transactions of the Zoological Society of London* 12: 249-348.
- Kirby, W. F. 1889b. Descriptions of new genera and species of Odonata in the collections of the British Museum, chiefly from Africa. *Proceedings of the scientific Meetings of the Zoological Society of London for the Year 1889*: 297-303.
- Kirby, W. F. 1890. A synonymic catalogue of Neuroptera Odonata or dragonflies, with an appendix of fossil species. London, Gurney & Jackson. 202 pp.
- Kirk, T. 1897. Description of a new genus of Gramineae: *Transactions and Proceedings of the New Zealand Institute* 29: 497.
- Kosterin, O.E. 2016. Reconsideration of the genera *Merogomphus* Martin, 1904, and *Anisogomphus* Selys, 1857, including erection of a new genus, with a new species and discussion of additional specimens from Cambodia. *Zootaxa* 4171 (1): 51-76.
- Krüger, L. 1898. Die Odonaten von Sumatra. I. Theil. Familie Agrioniden. *Stettiner entomologische Zeitung* 59: 64-139.
- Krüger, L. 1899a. Die Odonaten von Sumatra. II. Theil. Familie Aeschniden. *Stettiner entomologische Zeitung* 59: 267-331.
- Krüger, L. 1899b. Die Odonaten von Sumatra. III. Theil. a. Familie Libelluliden. *Stettiner entomologische Zeitung* 60: 321-338.
- Krüger, L. 1899c. Insektenwanderungen zwischen Deutschland und den Vereinigten Staaten und ihre wirtschaftliche Bedeutung. Herausgegeben vom Entomologischen Verein Stettin. Berlin, Friedländer. VIII+174 pp.
- Krüger, L. 1900. Insektenwanderungen zwischen Deutschland und den Vereinigten Staaten. Bemerkungen zum Aufsatz des Herrn Dr. Reh in Nro. 2 S. 120 dieser Zeitschrift. *Zeitschrift für Pflanzenkrankheiten* 10 (3/4): 235-241.
- Krüger, L. 1901. Michel Edmond de Selys-Longchamps †. *Stettiner entomologische Zeitung* 62: 214-217.
- Krüger, L. 1902a. Die Odonaten von Sumatra. III. Theil. b. Familie Libelluliden. *Stettiner entomologische Zeitung* 63: 58-193.
- Krüger, L. 1902b. Die Odonaten von Sumatra. III. Theil. b. Berichtigung. *Stettiner entomologische Zeitung* 63: 376.
- Krüger, L. 1903. Die Arten der Odonatengattung *Neurothemis*. *Stettiner entomologische Zeitung* 64: 248-291
- Krüger, L. 1906. Zum biologischen Unterricht. Aufgaben und Ziele. Jahresbericht des Friedrich-Wilhelms-Realgymnasiums Stettin Bd. 66: 1-13.
- Krüger, L. 1912. Osmylidae. Beiträge zu einer Monographie der Neuropterenfamilie der Osmyliden. *Stettiner entomologische Zeitung* 73: 319-373.
- Krüger, L. 1913a. Osmylidae. Beiträge zu einer Monographie der Neuropterenfamilie der Osmyliden II. Charakteristik der Familie, Unterfamilien und Gattungen aufgrund des Geäders. *Stettiner entomologische Zeitung* 74: 3-123.
- Krüger, L. 1913b. Osmylidae. Beiträge zu einer Monographie der Neuropterenfamilie

- der Osmyliden III. Literatur und Katalog. Stettiner entomologische Zeitung 74: 193-224.
- Krüger, L. 1913c. Osmylidae. Beiträge zu einer Monographie der Neuropterenfamilie der Osmyliden IV. Beschreibung der Arten. Stettiner entomologische Zeitung 74: 225-294.
- Krüger, L. 1913d. Festschrift zur Eröffnung des Städtischen Museums zu Stettin am 23. Juni 1913, gewidmet vom Entomologischen Verein. Stettin, Graßmann. 38 pp.
- Krüger, L. 1913e. Dr. Heinrich Dohrn. *16. April 1838 † 1. Oktober 1913. Stettiner entomologische Zeitung 74: 2-4 after p. 352.
- Krüger, L. 1914. Osmylidae. Beiträge zu einer Monographie der Neuropterenfamilie der Osmyliden V-VII. Stettiner entomologische Zeitung 75: 9-130.
- Krüger, L. 1915a. Neuroptera. Eine historisch-systematische Übersicht. I. Neuroptera L. bis Neuroptera Erichs. Stettiner entomologische Zeitung 76: 3-51.
- Krüger, L. 1915b. Osmylidae. Beiträge zu einer Monographie der Neuropterenfamilie der Osmyliden. VIII. Anhang II. Stettiner entomologische Zeitung 76: 60-87.
- Krüger, L. 1916. Myrmeleonidae. Beiträge zur Kenntnis der Neuropterenfamilie der Myrmeleoniden. Entomologische Zeitung Stettin 77: 158 - 162.
- Krüger, L. 1917. Neuroptera. Eine historisch-systematische Uebersicht. II. Phylogenetische Umgrenzung der echten Neuropteren: Neuropteroideae Hdl. Stettiner entomologische Zeitung 78:116-137. 1 Tf.
- Krüger, L. 1920a. Zur Aufstellung einer pommerschen Fauna. Abhandlungen und Berichte der pommerschen naturforschenden Gesellschaft 1: 10-13.
- Krüger, L. 1920b. Zur Säugetierfauna Pommerns. Vorwort und Bitte um Mitarbeit . Abhandlungen und Berichte der pommerschen naturforschenden Gesellschaft 1: 14-17.
- Krüger, L. 1920c. Vorgeschichte der Säugetierfauna Pommerns. Abhandlungen und Berichte der pommerschen naturforschenden Gesellschaft 1: 17-33.
- Krüger, L. 1920d. Unsere stattlichsten Netzflügler: *Myrmeleon* und *Osmylus*. Abhandlungen und Berichte der pommerschen naturforschenden Gesellschaft 2: 102-103.
- Krüger, L. 1920e. Libellen und Netzflügler. Bitte um Einsendung zur Bestimmung. Abhandlungen und Berichte der pommerschen naturforschenden Gesellschaft 2: 103.
- Krüger, L. 1921a. Übersicht über die Säugetier-Fauna Mecklenburgs und Pommerns nach Quellen des 19. Jahrhunderts: Boll 1848, Struck 1876, von Homeyer 1847, Holland 1871. Abhandlungen und Berichte der pommerschen naturforschenden Gesellschaft 2: 56-79
- Krüger, L. 1921b. *Myrmeleon*, Ameisenlöwe. Abhandlungen und Berichte der pommerschen naturforschenden Gesellschaft 2: 103.
- Krüger, L. 1922a. Psychopsidae. Beiträge zu einer Monographie der Neuropteren-Familie der Psychopsiden. Stettiner entomologische Zeitung 83: 17-48.
- Krüger, L. 1922b. Berothidae. Beiträge zu einer Monographie der Neuropteren-Familie der Berothiden. Stettiner entomologische Zeitung 83: 49-88.
- Krüger, L. 1922c. Hemerobiidae. Beiträge zu einer Monographie der Neuropteren-Familie der Hemerobiiden. Stettiner entomologische Zeitung 83: 138-173.
- Krüger, L. 1923a. Sisyridae. Beiträge zu einer Monographie der Neuropteren-Familie der Sisyriden. Stettiner entomologische Zeitung 84: 25-66.

- Krüger, L. 1923b. Neuroptera succinica Baltica. Die im Baltischen Bernstein eingeschlossenen Neuropteren des Westpreußischen Provinzialmuseums in Danzig. Stettiner entomologische Zeitung 84: 68-92.
- Krüger, L. 1925a. Die Großschmetterlinge des Pommerschen Odertales. Abhandlungen und Berichte der pommerschen naturforschenden Gesellschaft 5: 78.
- Krüger, L. 1925b. Blattwespen Pommerns. Abhandlungen und Berichte der pommerschen naturforschenden Gesellschaft 5: 78.
- Krüger, L. 1925c. Wespen und Bienen Pommerns. Abhandlungen und Berichte der pommerschen naturforschenden Gesellschaft 5: 78-79.
- Krüger, L. 1925d. Eine Einführung in das Studium der Libellen mit einer Uebersicht der pommerschen Fauna. Abhandlungen und Berichte der pommerschen naturforschenden Gesellschaft 6: 53-106.
- Krüger, L. 1925e. Die Großschmetterlinge des pommerschen Odertals. Abhandlungen und Berichte der pommerschen naturforschenden Gesellschaft 6: 108-109.
- Krüger, L. 1931. Nachruf. Rektor Gustav Schröder – Stettiner Entomologische Zeitung 92: 322-323.
- Krüger, L. & O. Richter 1920: *Meles meles* L. Vorkommen vom Dachs in der Buchheide. Abhandlungen und Berichte der pommerschen naturforschenden Gesellschaft 1: 97-98.
- Laidlaw, F.F. 1915. Notes on oriental dragonflies in the Indian Museum. No.3. Indian species of the legion *Protoneura*. Records of the Indian Museum 11(5): 387-391.
- Laidlaw, F.F. 1917. A list of the dragonflies recorded from the Indian empire, with special reference to the collection of the Indian Museum. Part II. The family Agrionidae. A. The section *Podolestes*, *Platycnemis*, *Platysticta*, and *Protoneura*. Records of the Indian Museum 13(6): 321-348, pl. 1315.
- Laidlaw, F.F. 1922. A list of the Dragonflies recorded from the Indian Empire with special reference to the collection of the Indian Museum. Part V. The subfamily Gomphinae. With an Appendix by F. C. Fraser. Records of the Indian Museum 24: 367-414.
- Laidlaw, F.F. 1926. Spolia Mentawiensia. Dragonflies (Odonata). Journal of the Malayan Branch of the Royal Asiatic Society 4 (2): 214-233.
- Laidlaw, F. F. 1950. A survey of the Chlorocyphidae (Odonata: Zygoptera), with diagnoses of proposed new genera, and description of a new geographical subspecies. Transactions of the Royal Entomological Society London 101 (8): 257-280, figs. 1-8.
- Latreille, P.A. 1802. Histoire naturelle générale et particulière des crustacés et insectes III. Familles naturelles des genres. Paris, Dufart. 468 pp.
- Leach, W. E. 1815. Entomology. In Brewster, D., The Edinburgh Encyclopedia 9: 57-172.
- Liang, A.-P. 1997. Cercopoidea types of species described by Edmund Schmidt in the U.S. National Museum of Natural History, with lectotype designations (Homoptera: Cercopoidea). Entomological News 108: 222-228.
- Lieftinck, M . A. 1932. Notes on the Genus *Libellago* Selys, with descriptions of two new species (Odon.). Konowia 11: 1-11.
- Lieftinck, M . A. 1935. A Synopsis of the Odonata (Dragonflies) of Sumatra. Miscellanea Zoologica Sumatrana 1: 1-23.

- Lieftinck, M.A. 1941. Studies on oriental Gomphidae (Odon.) with descriptions of new or interesting larvae. *Treubia* 18 (2): 233- 253.
- Lieftinck, M. A. 1948. The Odonata of Engano with a survey of the dragonfly-fauna of the West Sumatran chain of islands. *Treubia* 19 (2): 279-304.
- Lieftinck, M.A. 1954. Handlist of Malaysian Odonata. A catalogue of the dragonflies of the Malay peninsula, Sumatra, Java and Borneo, including the adjacent small islands. *Treubia* 22 (Suppl.): xiii + 202 pp.
- Lieftinck, M.A. 1971. A catalogue of the type specimens of Odonata preserved in the Netherlands, with a supplementary list of the Odonata types described by Dutch scientists deposited in foreign institutional collections. *Tijdschrift voor Entomologie* 114 (2): 65-139.
- Linnæus, C. 1758. *Systema naturae per regna tria naturae, secundum classes, ordines, genera, species, cum characteribus, differentiis, synonymis, locis*. Tom. I (Animalia). Ed. decima. Holmiae (= Stockholm), Laurentius Salvius. iv + 824 pp.
- Makarkin, V.N., Wedmann, S. & T. Weiterschan 2016. A new genus of Hemeroibiidae (Neuroptera) from Baltic amber, with a critical review of the Cenozoic *Megalomus*-like taxa and remarks on the wing venation variability of the family. *Zootaxa* 4179 (3): 345-370.
- Makarkin, V.N., Archibald, S.B. & R.W. Mathewes 2021. New Protosmylinae (Neuroptera: Osmylidae) from the early Eocene of western North America, with taxonomic remarks. *Zootaxa* 4980 (1): 142–156.
- Martin, L. 1922. Hans Fruhstorfer †. *Deutsche entomologische Zeitschrift Iris* 36: 96-103.
- Martin, R. 1904. Liste des Neuroptères de l'Indo-Chine, pp. 204-221 in: Mission Pavié Indo-Chine 1879-1895. Vol III: Recherches sur l'histoire naturelle de l' Indo-Chine orientale. Paris, E. Leroux 1904. 559 pp.
- Meyer, W. 1939. Geschichte des Stettiner Entomologischen Vereins. Für den Druck vorbereitet und ergänzt von A. Kästner. *Stettiner entomologische Zeitung* 100: (2)-(71).
- McLachlan, R. 1895. Some new species of Odonata of the "Legion" *Lestes*, with notes. *Annals and Magazine of Natural History* (6) 16: 19-28.
- Monserrat, V.J. 1986. Longinos Navás, his neuropterological work and collection. pp. 173-176 in: Gepp, J., Aspöck, H. & H. Hölzel (eds), 1986. Recent Research in Neuropterology. Proceedings of the 2nd International Symposium on Neuropterology (21-23 August 1984, Hamburg, Germany; held in association with the XVII International Congress of Entomology). Graz, Austria, Privately printed. 176 pp.
- Monserrat, V. J. 1990. A systematic checklist of the Hemeroibiidae of the world (Insecta: Neuroptera). pp. 215-262. In: Mansell, M.W. & H. Aspöck (eds.). 1990. Advances in Neuropterology. Proceedings of the Third International Symposium on Neuropterology (3-4 February 1988, Berg en Dal, Kruger National Park, South Africa). Pretoria, South African Department of Agricultural Development.
- Moufetiüs, T. 1634. *Insectorum sive minimorum animalium theatrum*. London, Cotes. 326 pp.
- Nakahara, W. 1965. Neotropical Hemeroibiidae in the United States National Museum. *Proceedings of the United States National Museum* 117: 107-122.

- Nakahara, W. 1966. Hemerobiidae, Sisyridae and Osmyliidae of Formosa and Ryukyu Islands (Neuroptera). *Kontyû* 34: 193-207.
- Navás, R.P. L. 1929. Monografía de los Berótidós (Insectos Neurópteros). *Memorias de la Academia de Ciencias Exactas, Físico-Químicas y Naturales de Zaragoza* 2: 1-107.
- Newman, E. 1833. Entomological notes. *Entomological Magazine London* 1: 505-514.
- Orr, A.G. 1999. *Sundacypha striata* spec. nov., a new damselfly from Borneo (Zygoptera: Chlorocyphidae). *Odonatologica* 28 (2): 181-185.
- Oswald, J.D. 1993. Revision and cladistic analysis of the world genera of the family Hemerobiidae (Insecta: Neuroptera). *Journal of the New York Entomological Society* 101: 143-299.
- Pfaffl, F. 2017. Zur Geschichte der Pommerschen Naturforschenden Gesellschaft (1918-1944) in Stettin an der Oder. *Der Bayerische Wald* 30 (N.F. 1-2): 64-68.
- Rambur, P. 1842. *Histoire Naturelle des Insectes. Névroptères*. Librairie Encyclopédique de Roret: Paris. xvii 534 pp.
- Ris, F. 1900. Libellen vom Bismarck-Archipel, gesammelt durch Prof. Friedrich Dahl. *Archiv für Naturgeschichte* 66 (1): 175-204.
- Ris, F. 1909a. Libellulinen 1. Collections zoologiques du Baron Edm. de Selys-Longchamps. Catalogue systématique et descriptif, fasc. 9: 1-120.
- Ris, F., 1909b. Odonata. In: A. Brauer, *Süßwasserfauna Deutschlands Heft 9*. Jena, Fischer. 67pp.
- Ris, F., 1910. Libellulinen 2. Collections zoologiques du Baron Edm. de Selys-Longchamps. Catalogue systématique et descriptif, fasc. 10: 121-244.
- Ris, F. 1911. Libellulinen 5. Collections zoologiques du Baron Edm. de Selys Longchamps: Catalogue systématique et descriptif, fasc. 13: 529-700
- Schmidt, Er. 1934. Odonata der Deutschen Limnologischen Sunda-Expedition. 1. Imagines — Mit Beschreibungen zweier neuer *Ictinus* aus Celebes und Neu-Guinea“. *Archiv für Hydrobiologie, Supplement* 13: 316-397.
- Seehausen, M. & R. Dow 2016. Morphological studies and taxonomic considerations on the 'reddish-brown-winged' group of *Neurothemis* Brauer, 1867 with the description of *N. taiwanensis* sp. nov. (Odonata: Libellulidae). *International Dragonfly Fund Report* 93. 101 pp.
- Selys-Longchamps, E. de 1840. *Monographie des libellulidées d'Europe*. Paris, Rôret. xxii+408 pp.
- Selys-Longchamps, E. de 1853. Synopsis des Caloptérygines. *Bulletins de l'Académie Royale des Sciences, des Lettres, et des Beaux-Arts de Belgique* 20, Annexe: 1–73.
- Selys-Longchamps, E. de 1854. Synopsis des Gomphines. *Bulletins de l'Académie Royale des Sciences, des Lettres, et des Beaux-Arts de Belgique* 21: 23–112.
- Selys-Longchamps, E. de 1857. Odonates de Cuba. In: R. de la Sagra, *Histoire physique, politique, et naturelle de l'Île de Cuba*. Animaux articulés 7: 436–471.
- Selys-Longchamps, E. de 1858. *Monographie des Gomphines, avec la collaboration de M. le docteur H.A. Hagen (de Koenigsberg)*. *Mémoires de la Société Royale des Sciences de Liège* 11: 257-720.

- Selys-Longchamps, E. de 1859. Additions au Synopsis des Caloptérygines. Bulletins de l'Académie Royale des Sciences, des Lettres, et des Beaux-Arts de Belgique (Sér. 2) 7: 437-451.
- Selys-Longchamps, E. de 1860. Synopsis des Agrionines, Dernière légion: *Protonevra*. Bulletins de l'Académie Royale des Sciences, des Lettres, et des Beaux-Arts de Belgique (2) 10: 431-462.
- Selys-Longchamps, E. de 1862a. Synopsis des Agrionines, Seconde légion: *Lestes*. Bulletins de l'Académie Royale des Sciences, des Lettres, et des Beaux-Arts de Belgique (2) 13: 288-338.
- Selys-Longchamps, E. de 1862b. Synopsis des Agrionines, Troisième légion: *Podagrion*. Bulletins de l'Académie Royale des Sciences, des Lettres, et des Beaux-Arts de Belgique (2) 14: 5-44.
- Selys-Longchamps, E. de 1863. Synopsis des Agrionines, Quatrième légion: *Platycnemis*. Bulletins de l'Académie Royale des Sciences, des Lettres, et des Beaux-Arts de Belgique (2) 16: 147-176.
- Selys-Longchamps, E. de 1865. Synopsis des Agrionines, 5me legion: *Agrion*. Bulletins de l'Académie Royale des Sciences, des Lettres, et des Beaux-Arts de Belgique (Sér. 2) 20: 375-417.
- Selys-Longchamps, E. de 1871. Synopsis des Cordulines (en deux parties). Bulletins de l'Académie Royale des Sciences, des Lettres, et des Beaux-Arts de Belgique (Sér. 2) 31: 238-316, 519-565.
- Selys-Longchamps, E. de 1876. Synopsis des Agrionines, 5me légion: *Agrion* (suite). Le genre *Agrion*. Bulletins de l'Académie Royale des Sciences, des Lettres, et des Beaux-Arts de Belgique (2) 42: 490-531, 952-991.
- Selys-Longchamps, E. de 1877. Synopsis des Agrionines, 5me legion: *Agrion* (suite et fin). Les genres *Telebasis*, *Argiocnemis* et *Hemiphlebia*. Bulletins de l'Académie Royale des Sciences, des Lettres, et des Beaux-Arts de Belgique (2) 43: 97-159.
- Selys-Longchamps, E. de 1878a. Quatriemes additions au synopsis des Gomphines. Bulletins de l'Académie Royale des Sciences, des Lettres, et des Beaux-Arts de Belgique (2) 46: 408-471, 658-698.
- Selys-Longchamps, E. de 1878b. Odonates de la région de la Nouvelle Guinée. I. Considérations sur la faune de la Nouvelle Guinée, des Molucces et de la Célèbes. Mitteilungen des Königlich zoologischen Museums Dresden 3: 289-322.
- Selys-Longchamps, E. de 1879. Quatrièmes Additions au Synopsis des Caloptérygines. Bulletins de l'Académie Royale des Sciences, des Lettres, et des Beaux-Arts de Belgique (2) 47: 349-409.
- Selys-Longchamps, E. de 1882. Sur la distribution des Insectes Odonates en Afrique. Association française pour l'avancement des Sciences, Congrès d'Alger: Compte rendu de la 10e session, Alger 1881: 663-669.
- Selys-Longchamps, E. de 1883. Les Odonates du Japon. Annales de la Société entomologique de Belgique 27: 82-143.
- Selys-Longchamps, E. de 1886. Revision du Synopsis des Agrionines, Première partie comprenant les legions *Pseudostigma*, *Podagrion*, *Platycnemis* et *Protonevra*). Mé-

- moirs couronnés et autres memoirs publiés par l'Académie royale des Sciences, des Lettres et des Beaux Arts de Belgique 38 (4): 233 pp.
- Selys-Longchamps, E. de 1891. Viaggio de Leonardo Fea in Birmania e regioni vicine. XXXII. Odonates. Annali del Museo civico di Storia naturale di Genova 30 [= (2) 10]: 433-518.
- Selys-Longchamps, E. de 1898. Causeries Odonatologiques. No.11 (4). Sur les noms *Euphaea* et *Calopteryx*. Annales de la Société entomologique de Belgique 42: 337-338.
- Steinmann, H. 1997. World Catalogue of Odonata: I. Zygoptera. II. Anisoptera. Berlin, New York, De Gruyter. xxi+500 & xiv+636 pp.
- Urbahn, E. 1943. Professor Leopold Krüger. 2. 12. 1861 – 6. 9. 1942. Stettiner entomologische Zeitung 104:181-182.
- Uschmann, G. 1964. Gerstäcker, Adolph; in: Neue Deutsche Biographie 6 (1964): 323.
- Wasscher, M. Th. & H.J. Dumont 2013. Life and work of Michel Edmond de Selys Longchamps (1813-1900). Odonatologica 42 (4): 369-402.
- Wichard, W., Wedmann, S. & T. Weiterschan 2016. Spongillaflies (Neuroptera, Sisyridae) in Baltic amber. Zootaxa 4158 (1): 117–125.
- Wilfert, M., Wendt, E. & J. Philippen 2016. Der entomologische Verein zu Stettin, seine Sammlungen und seine Zeitschriften von 1837–1945. Baltische Studien. N.F. 102: 169–198.
- Williamson, E.B. 1899. Dragonflies of Indiana. In: Indiana Department of Geology and Natural Resources, Twenty-Fourth Annual Report: 229-333.
- Winterton, S.L., Lemmon, A.R., Gilling, J.C., Gerzon, I.J., Badano, D., Bakkes, D.K., Breitreuz, L.C.V., Engel, M.S., Moriarty Lemmon, E., Liu, X., Machado, R.J.P., Skevington, J.H. & J.D. Oswald 2017. Evolution of lacewings and allied orders using anchored phylogenomics (Neuroptera, Megaloptera, Raphidioptera). Systematic Entomology 43 (2): 330-354.
- Winterton, S.L., Martins, C.C., Makarkin, V, Ardila-Camacho, A. & Y. Wang 2019. Lance lacewings of the world (Neuroptera: Archeosmylidae, Osmylidae, Saucrosmylidae): review of living and fossil genera. Zootaxa 4581(1): 1-99.
- Zessin, W. 2018. Vor 180 Jahren: Gründung des Stettiner Entomologischen Vereins am 6. November 1837. Virgo 20 (1): 3-10.
- Zott, R. 2007. „Man lebe in einer Zeit allgemeinsten pädagogischen Interesses ... “. Mitteilungen, herausgegeben von der Fachgruppe 'Geschichte der Chemie' in der Gesellschaft Deutscher Chemiker: 19: 78-106.

Unpublished material:

- Material concerning Krüger's familiar background (Stadtarchiv Stralsund)
- Krüger's exam papers (University Greifswald, archives)
- Krüger's personal file (Bibliothek für Bildungsgeschichtliche Forschung, Berlin)
- Güsten, R. 2005: Zwischenbericht zum vom International Dragonfly Fund e.V. initiierten Projektes: „Dokumentation der Libellensammlung von Leopold Krüger im Museum and

Institute of Zoology, Polish Academy of Sciences, Warschau“. Dezember 2005. 3 pp.
Dekoninck, W. 2021. Provisional list of the Odonata in the Collection Selys at RBINS.

Internet sources:

<http://d-nb.info/gnd/1037279808>

http://pomeranica.pl/wiki/Leopold_Kr%C3%BCger (Małgorzata Elżbieta Płoszczyńska)

Mierzwa D. 2017. Odonata Collection. Museum and Institute of Zoology, Polish Academy of Sciences. Occurrence dataset <https://doi.org/10.15468/pdofpu> accessed via GBIF.org on 2021-07-23. <https://www.gbif.org/occurrence/1707096224>

Paulson, D. L. & M. Schorr 2020. World Odonata List. <https://www2.pugetsound.edu/academics/academic-resources/slater-museum/biodiversity-resources/dragonflies/world-odonata-list/>

(Photograph fig. 3): <http://hdl.handle.net/10934/RM0001.COLLECT.376434>

Wikipedia has been consulted in English and / or German on

Aspasia; Berothidae; Echo; H.J. Feuerborn; A.B. Frank; Franzburg; A. Gerstäcker; Fulvia; Hakenterrasse; Hemerobiidae; Lara; F. Lau; W. Nakahara; Museum auf der Hakenterrasse; *Myrmeleontidae*; Neuroptera; v. Normann; Osmylidae; A. Portal; Psychopsidae; San José scale; Sylphis; Sophronia; P. Sorauer ; Stettin; Sukaranda; Sumba; Sundaland.

More information about the museum at Stettin and its collections may be found in:

Kubiak, S.P. & D. Kacprzak (eds.) 2013. 100 lat muzeum w Szczecinie / 100 Jahre Museum in Stettin. Muzeum Narodowe w Szczecinie, Szczecin. 249 pp.

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