

# Friedrich Moritz Brauer's and Johann Jakob Kaup's types of dragonflies (Insecta: Odonata) in the Hessisches Landesmuseum Darmstadt

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## Abstract

The present status of 40 type specimens of 18 nominal dragonfly taxa described by F. M. Brauer and J. J. Kaup in three publications between 1866 and 1867 is presented. These taxa – here listed according to their original generic assignment – are: *Neurobasis kaupi* Brauer, 1867, *Rhinocypha ustulata* Kaup in B., 1867, *Gynacantha rosenbergi* Kaup in B., 1867, *Diplax cora* Kaup in B., 1867, *Diplax denticauda* Brauer, 1867, *D. thoracanta* Brauer, 1867, *Perithemis duivenbodei* Brauer, 1866, *Agrinoptera quatuornotata* Brauer, 1867, *Libellula pectoralis* Kaup in B., 1867, *L. coronata* Kaup in B., 1866, *Polyneura decora* Kaup in B., 1866, *P. ramburii* Kaup in B., 1866, *Neurothemis pseudosphronia* Brauer, 1867, *N. innominata* Brauer, 1867, *N. diplax* Brauer, 1867, *Celithemis pygmaea* Brauer, 1867, *Tramea loewii* Kaup in B., 1866, and *T. rosenbergi* Brauer, 1866. The types are deposited in the insect collections of the Hessisches Landesmuseum, Darmstadt (Germany) and the Natural History Museum, Vienna (Austria).

## Kurzfassung

Der derzeitige Status von 40 Typusexemplaren von 18 nominellen Libellenarten, die F. M. Brauer und J. J. Kaup in drei Arbeiten zwischen 1866 und 1867 veröffentlichten wird dargestellt. Diese Taxa – hier nach ihrer ursprünglichen Gattungszuordnung gelistet – sind: *Neurobasis kaupi* Brauer, 1867, *Rhinocypha ustulata* Kaup in B., 1867, *Gynacantha rosenbergi* Kaup in B., 1867, *Diplax cora* Kaup in B., 1867, *Diplax denticauda* Brauer, 1867, *D. thoracanta* Brauer, 1867, *Perithemis duivenbodei* Brauer, 1866, *Agrinoptera quatuornotata* Brauer, 1867, *Libellula pectoralis* Kaup in B., 1867, *L. coronata* Kaup in B., 1866, *Polyneura decora* Kaup in B., 1866, *P. ramburii* Kaup in B., 1866, *Neurothemis pseudosphronia* Brauer, 1867, *N. innominata* Brauer, 1867, *N. diplax* Brauer, 1867, *Celithemis pygmaea* Brauer, 1867, *Tramea loewii* Kaup in B., 1866, und *T. rosenbergi* Brauer, 1866. Die Typusexemplare werden in den Insektensammlungen des Hessischen Landesmuseums Darmstadt (Deutschland) und des Naturhistorischen Museums Wien (Österreich) aufbewahrt.

## Introduction

Several years ago a short note was published (SCHNEIDER 1995) explaining why the zoologist Johann Jakob Kaup (1803–1873) who held the position of »Inspektor« at the natural history collection of the Grand-ducal Museum in Darmstadt from 1830 to 1873, is the author of seven southeast Asian dragonfly taxa described in detail by Friedrich Moritz Brauer (1832–1904) in three subsequent publications (1866, 1867a, 1867b). These taxa are: *Gynacantha rosenbergi*, *Tramea loewii*, *Protorthemis coronata*, *Neurothemis decora*, *N. ramburii*, *Lathrecista (asiatica) pectoralis*, and *Macrodiplax cora*; *Rhinocypha ustulata*, not mentioned in SCHNEIDER (1995), is added in this publication. One of the very few to acknowledge and honour in his own publications Kaup's contribution to odonatology was Michel-Edmond de Selys-Longchamps (1813–1900).

Between 1857 and 1863 Kaup received odonate specimens collected in southeast Asia by Hermann von Rosenberg (1817–1888), a former student of his in zoology in Darmstadt who was now working for the Dutch in the Netherlands East Indies (HELDMANN 1955, 1958; HEFELE 1959). Additional collections were sent to Darmstadt by the Dutch Renesent van Duivenbode, at that time resident in Menado, Sulawesi, now modern Indonesia (KAUP 1867, 1869). The specimens, mainly from New Guinea, Amboin (Amboina), Sulawesi (Celebes), and Serang (Ceram), contained a small but valuable collection of Odonata. Kaup was of course aware that any collection from this remote area which was at that time terra incognita from the odonatological point of view would contain species new to science. He identified the species to the best of his knowledge and assigned names to those which he considered new to science. Recognizing that he was not an authority on Odonata himself, he sent his specimens for verification of his identifications to the director of the Natural History Museum in Vienna, the famous odonatologist Friedrich Moritz Brauer (1832–1904). BRAUER wrote in the introduction of his 1866 publication: »Herr Dir. Kaup in Darmstadt hat mir seine Libellen zur Bearbeitung eingesendet. Dieselben sind von ihm bereits benannt und ich habe bei seinen Arten die Namen nur dann geändert, wenn dieselben schon bei Libellen vergeben waren.« This reads, e.g. for *Tramea rosenbergi* and *Protorthemis coronata*: »**Tramea Rosenbergi** m. L. Braueri Kaup. in litt. Nr. 6.« (1866: 564), respectively »**Libellula coronata** Kaup. in litt. Nr. 13.« (1866: 565). The addition »m.« (in other cases »mihi«) means that Brauer claimed authorship for the new taxon.

Although most of the type specimens of species described by Brauer in the above mentioned publications are not mentioned in the Odonata type catalogue of the Natural History Museum Vienna (ST. QUENTIN 1970), most Odonatists assumed they were kept in this Museum (e.g. LIEFTINCK 1955), others considered them lost.

While checking Johann Jakob Kaup's insect collection in the holdings of the Hessisches Landesmuseum Darmstadt, three drawers with Odonata were found (Nos »46«, »47«, and »48«; the context and history of this numbering remains unclear). As most of the specimens were of southeast Asian origin, and the data on the labels in perfect agreement with the information provided by Brauer, it soon became evident that the drawers contained nearly all the type specimens mentioned in Brauer's papers (l.c.): 30 in the HLMD, 10 in NHMW, and one lost.

It cannot be the aim of this paper to comment on the validity of all taxa. This task is to be left to odonatists who are planning to revise or currently revising the relevant genera or species groups. Nevertheless, in cases where Kaup's and Brauer's nominal taxa have generally been accepted as synonyms, they are listed under the names generally accepted and currently in use.

## Abbreviations

HLMD: Hessisches Landesmuseum Darmstadt, Germany.  
NHMW: Naturhistorisches Museum Wien, Austria.  
NNMN: Nationaal Natuurhistorisch Museum Naturalis, Leiden, The Netherlands (formerly RMNH: Rijksmuseum van Natuurlijke Historie, Leiden).  
HT: Holotypus.  
LT: Lectotypus  
PLT: Paralectotypus.  
ST: Syntypus.

## Systematic part

The arrangement of families and genera follows DAVIES & TOBIN (1984, 1985) and BRIDGES (1994). Within families, species are listed in alphabetical order.

### Calopterygidae

*Neurobasis kaupi* Brauer, 1867 (Figs 3.1 & 3.2)  
*Neurobasis Kaupi* Brauer, 1867b. - Verh. zool.-bot. Ges. Wien, 17: 293 [male, female, Celebes].  
*Neurobasis Kaupii*. - Selys, 1869; Bull. Acad. r. Belg., (2)27: 649.  
*Neurobasis Kaupei* [sic]. - Selys, 1878; Mitt. K. zool. Mus. Dresden, 3: 295.  
*Neurobasis Kaupi*. - Selys, 1879; Bull. Acad. r. Belg., (2)47: 359.  
*Neurobasis Kaupi*. - Selys, 1882; An. Soc. esp. Hist. nat., 11: 19.  
*Neurobasis Kaupi*. - Hagen, 1887; Ver. zool.-bot. Ges. Wien, 37: 647.  
*Neurobasis chinensis* Race *Kaupi*. - Selys, 1897; Annls Soc. ent. Belg., 41: 429.  
*Neurobasis chinensis Kaupi*. - Ris, 1916; Entom. Mitteil., 5: 315 (♀♂ Celebes, Mus. Darmstadt).  
*Neurobasis kaupi*. - Lieftinck, 1949; Nova Guinea (n.s.), 5: 14, 22.  
*Neurobasis kaupi kaupi*. - Lieftinck, 1955; Nova Guinea (n.s.), 6: 158.  
*Neurobasis kaupi pavo* Lieftinck, 1955. - Nova Guinea (n.s.), 6: 158.

*Neurobasis kaupi kaupi*. - Steinmann, 1997; World Catalogue of Odonata. Volume I Zygoptera: 25 (Type male: Darmstadt Museum).

*Neurobasis kaupi*. - Schneider, 1997; Informationen aus dem Hessischen Landesmuseum Darmstadt, 2|97: 22 [male and female syntypes depicted].

Specimens examined: ♂ Lectotypus, HLMD-Odo-23-LT (here designated as Lectotypus): Label 1: *Neurobasis Kaupi* v. R. Celebes [handwritten]. Label 2 (red): ♂ Syntypus von *Neurobasis kaupi* Brauer, 1867, det. W. Schneider 1997, ♂ Lectotypus des. W. Schneider. - 1 ♀ Paralectotypus, HLMD-Odo-24-PLT (here designated as Paralectotypus): Label 1: *Neurobasis Kaupi* Br. ♀ [handwritten]. Label 2 (red): ♀ Syntypus *Neurobasis kaupi* Brauer, 1867, det. W. Schneider 1997, ♀ Paralectotypus des. W. Schneider. - Long series of both sexes (including the male holotype of subsp. *pavo* Lieftinck, 1955) from Celebes in NNMN.

LIEFTINCK (1949, 1955) has conclusively shown that *N. kaupi* Brauer, 1867 is a good species endemic to Sulawesi and not a synonym or subspecies of *chinesis* Linnaeus, 1758. As is evident from the original text, Brauer based his description on one male and one female. These syntypes which agree in all details with the diagnosis are kept in the collections of the HLMD and not in Vienna as assumed by LIEFTINCK (l.c.) The same author stated (1949: 22, sub *Neurobasis ianthipennis*) that HAGEN (1887) had examined Rosenberg's material of *kaupi* from North Celebes in the Leiden Museum. I could not find a single specimen collected by v. Rosenberg in this institution, but have examined there long series of *kaupi* collected by other entomologists in Celebes (Sulawesi). It would also be difficult to understand why Lieftinck should have designated a pair of *kaupi* collected in North Sulawesi by Coomans de Ruiter as »plesiotypes« of the nominal subspecies if he would have had material collected by v. Rosenberg at hand.

## Chlorocyphidae

### *Rhinocypha ustulata* Kaup in Brauer, 1867

(Figs 3.3–3.5)

*Rhinocypha ustulata* Kaup in Brauer, 1867b. -

Verh. zool.-bot. Ges. Wien, 17: 291 [♀, ♂, Ceram]

*Rhinocypha petiolata* Brauer, 1867b [nec Selys, 1859].

- Verh. zool.-bot. Ges. Wien, 17: 291 [♀, ♂, Ceram].

*Rhinocypha terminata* Selys, 1869. - Bull. Acad. r.

Belg. (2) 27: 662 [♀, ♂, Moluccas]

*Rhinocypha ustulata*. - Selys, 1878; Mitt. K. zool. Mus.

Dresden, 3: 296 [»ustulata Kaup in litteris Amboina,

Ceram.«].

*Rhinocypha petiolata*. - Selys, 1879; Bull. Acad. r. Belg.

(2) 47: 393.

*Rhinocypha ustulata*. - Ris, 1929; Treubia 7 (Suppl.):

141.

*Rhinocypha ustulata*. - Laidlaw, 1950; Trans. R. ent.

Soc. Lond., 101(8): 267.

Specimens examined: 1 ♂ Syntypus, HLMD-Odo-28-ST: Label 1: *Rhinocypha petiolata* G ♂, Ceram, v.R. [handwritten]. Label 2 (red): ♂ Syntypus *Rhinocypha ustulata* Kaup in Brauer, 1867, det. & des. W. Schneider 2004. - 1 ♀, HLMD-Odo-29-ST: Label 1: *Rhinocypha petiolata* Guer ♀ var., Ceram v.R. [handwritten]. Label 2 (red): ♀ Syntypus *Rhinocypha ustulata* Kaup in Brauer, 1867, det. & des. W. Schneider. - 1 ♀ Syntypus, HLMD-Odo-30-ST: Label 1: *Rhinocypha petiolata* G. ?, Ceram v.R. [handwritten]. Label 2 (red): ♀ Syntypus *Rhinocypha ustulata* Kaup in Brauer, 1867, det. & des. W. Schneider. - 1 ♂ Syntypus, NHMW (drawer 2|1): Label 1: Kaup, Ceram [handwritten]. Label 2: *terminata petiolata* [handwritten], det. Brauer [printed]. Label 3: *petiolata* (non Sel.) Brauer [handwritten]. Label 4: *terminata* [handwritten] det. Zerny [printed]. Label 5 [red, no text]. Label 6: ♂ Syntypus *Rhinocypha ustulata* Kaup in Brauer, 1867, det. W. Schneider, 17.12.99. - 1 ♂ Syntypus, NHMW (drawer 2|1): Label 1: Kaup 1867 [handwritten]. Label 2: *terminata petiolata* [handwritten] det. Brauer [printed]. Label 3: *terminata* [handwritten] det. Zerny [printed]. Label 4: ♂ Syntypus *Rhinocypha ustulata* Kaup in Brauer, 1897, det. W. Schneider, 17.12.99.

The reasoning for the above synonymy is the following: BRAUER (1867b) believed that the three males and two females from Ceram (leg. H. v. Rosenberg) were conspecific with female specimens from Ambon in the Vienna Museum (leg. Doleschall) which he had identified as *Rhinocypha petiolata* Selys, 1859 (»ustulata Kaup. in litt.«). Due to the fact that Selys' specimen of *petiolata* was notably smaller than his material from Ceram, Brauer believed that Selys based his description on a female (l.c., page 290): »Das Männchen ist unbeschrieben. *R. petiolata* De Selys ist, nach der Grösse zu schließen, nach einem Weibchen beschrieben; die mir vorliegenden Stücke sind etwas grösser als Selys angibt.« This was confirmed by SELYS (1879: 393) who translated Brauer's description of the specimens from Ceram and commented: »Ces exemplaires sont notablement plus grands que le type femelle de ma collection indiqué de Malacca par M. Wallace«, and then argued that they might deserve full specific status (l.c.): »C'est ce qui m'avait fait penser qu'ils formaient une espèce particulière à laquelle on devrait restituer le nom de *Rh. ustulata*, Kaup.« Therefore *petiolata* Brauer, 1867 is an objective synonym of *ustulata* Kaup in Brauer, 1867.

## Aeshnidae

### *Gynacantha rosenbergi* Kaup in Brauer, 1867

(Fig. 1.18)

*Gynacantha rosenbergi* Kaup in Brauer, 1867b. -

Verh. zool.-bot. Ges. Wien, 17: 295 [♂♂, New Guinea].

*Gynacantha rosenbergii*. - Selys, 1878; Mitt. K. zool.

Mus. Dresden, 3: 295.

*Gynacantha rosenbergi*. - Martin, 1908; Collins zool.

de Selys Longchamps, 18: 191.

*Gynacantha rosenbergi*. - St. Quentin, 1970; Ann.

Naturhistor. Mus. Wien, 74: 266.

*Gynacantha rosenbergi*. - Schneider, 1995; Entomol. Z.,

105: 255.

Specimens examined: ♂ Lectotypus (here designated), NHMW, Inv.-Nr. 953 (drawer 5|9): Label 1: Kaup, Neuguinea 867 [handwritten]. Label 2: Rosenbergi [handwritten] det. Brauer [printed]. Label 3: Type [handwritten]. Label 4: Rosenbergi [handwritten]. Label 5: det. H. Zerny [printed]. Label 6: G. rosenbergi Br., revid. 1955, M.A. Lieftinck, Type [handwritten]. Label 7 (red): *Gynacantha rosenbergi* Kaup in Brauer, 1867, ♂ Lectotypus, Inv.-Nr. 953, des. W. Schneider XII.1999 [handwritten]. - 1 ♂ Paralectotypus, HLMD-Odo-21-PLT: Label 1: *Gynacantha Rosenbergi* Kaup Br., ♂, N. Guinea, v. R. [handwritten by Kaup]. Label 2 (red): ♂ Paralectotypus, *Gynacantha rosenbergi* Kaup in Brauer, 1867, det. et des. W. Schneider 1997 [handwritten].

ST. QUENTIN's (1970) statement that the male specimen in the NHMW is the holotype is incorrect. Brauer (l.c.) based his description on two males, giving two measurements for the length of the abdomen (78–80 mm). The two specimens in question – both in good condition and conspecific – are therefore syntypes. The specimen of the NHMW is here designated as lectotype, the specimen of the HLMD as paralectotype.

### Libellulidae

***Brachydiplax denticauda*** (Brauer, 1867) (Fig. 2.4)  
*Diplax denticauda* Brauer, 1867b. - Ver. zool.-bot. Ges. Wien, 17: 289, 301 [♂, New Guinea].  
*Brachydiplax denticauda*. - Selys, 1878; Mitt. K. zool. Mus. Dresden, 3: 294.  
*Brachydiplax denticauda*. - Ris, 1910; Collns zool. de Selys Longchamps 11: 363.

Specimen examined: ♂ Holotypus, HLMD-Odo-26-HT: Label 1: ♂ *Diplax denticauda* Brauer, N. Guinea, v. R. [handwritten by Kaup]. Label 2 (red): ♂ Holotypus *Diplax denticauda* Brauer, 1867, des. W. Schneider 1997 [handwritten].

Brauer based his description on a single male: »Unterer Appendix fehlt dem Exemplar.« In fact, in the specimen before me, the inferior appendix is missing, and it matches the description in all other details. This and the fact that the species is not mentioned in St. Quentin's type catalogue (1970) confirm that the specimen in question is the holotype by monotypy.

### ***Brachydiplax duivenbodei*** (Brauer, 1866)

(Figs 1.5–1.7)  
*Perithemis Duivenbodei* Brauer, 1866. - Ver. zool.-bot. Ges. Wien, 16: 569 [♂♂, Neuguinea].  
*Microthemis duivenbodei* [sic]. - Selys, 1878; Mitt. K. zool. Mus. Dresden, 3: 294.  
*Brachydiplax Duivenbodei*. - Ris, 1910; Collns zool. de Selys Longchamps 11: 365.  
*Brachydiplax (Perithemis) duivenbodi* [sic]. - St. Quentin, 1970; Ann. Naturhistor. Mus. Wien, 74: 271 [Lectotypus und Paratypoid; Inv.-Nr. 1194].

Specimens examined: ♂ Lectotypus, NHMW, Inv.-Nr. 1194 (drawer 6|28): Label 1: Kaup, Neu Guinea [handwritten]. Label 2: *Perithemis Duivenbodei* Brauer Type [handwritten]. Label 3: *Duivenbodei* [handwritten], det. Brauer [printed]. Label 4: *Duivenbodei* det. H. Zerny. Label 5 (red): *Duivenbodei* Lectotype rev. Lieftinck 60. Label 6 (red): vidi W. Schneider XII.1999. - 1 ♂ Paralectotypus, NHMW, Inv.-Nr. 1194 (drawer 6|28; as lectotype): Label 1: kaup. 1867 [handwritten]. Label 2: Neuguinea [handwritten]. Label 3: *Duivenbodei* [handwritten] det. Brauer [printed]. Label 4: *Duivenbodei* det. H. Zerny. Label 5 (red): *Perithemis duivenbodei* Brauer, 1866, ♂ Paralectotypus, det. W. Schneider XII.1999. - 1 ♂ Paralectotypus, HLMD-Odo-8-PLT: Label from Kaup's hand reads: »*Perithemis Duivenbodei* B., N. Guinea, v. R.« Red label: ♂ Paralectotypus, *Perithemis duivenbodei* Brauer, 1866; det. et desig. W. Schneider 1997. - 1 ♂ Paralectotypus, HLMD-Odo-9-PLT: Label from Kaup's hand: »*Perithemis Duivenbodei* Br.« Red label: as above. - 1 ♂ Paralectotypus, HLMD-Odo-10-PLT: Label from Kaup's hand: »*Perithemis Duivenbodei* Br., Celebes.« Red label: as above.

ST. QUENTIN (1970) has designated a lectotype (selected by Lieftinck in 1960, but never published) and a »paratypoid« (= paralectotype in the sense of the ICZN). Unfortunately the specimen selected by Lieftinck as lectotype is a subadult male with very little pruinosity on the abdomen and the anal appendages missing. The paralectotype is in a much better condition. There are three males sub *Perithemis duivenbodei* in Kaup's collection in the HLMD, two from New Guinea and one from Celebes. Although BRAUER (l.c.) gave as terra typica »Neu-Guinea«, the male from Celebes is part of the syntype series (five males). The three males in the holdings of the HLMD are therefore paralectotypes.

### ***Raphismia bispina*** (Hagen, 1867) (Fig. 2.5)

*Diplax bispina* Hagen, 1867. - Stett. ent. Ztg, 28: 91.  
*Diplax thoracantha* Brauer, 1867b. - Ver. zool.-bot. Ges. Wien, 17: 299 [♂, Ceram].  
*Brachydiplax? thoracantha*. - Selys, 1878. - Mitt. K. zool. Mus. Dresden, 3: 293 & 302.

Specimen examined: ♂ Holotypus, HLMD-Odo-25-HT: Label from Kaup's hand reads: »♂ *Diplax thoracantha* Br., Ceram«. Red label: ♂ Holotypus *Diplax thoracantha* Brauer, 1867; des. & det. W. Schneider 1997.

I agree with RIS (1910) that Hagen's name *bispina* is almost a nomen nudum. SELYS (1878: 303) even considered Hagen's name as not published: »Le Dr. Hagen a signalé mais non décrit sous le nom de *Diplax bispina* un mâle de Morotai, ...«. BRAUER (1867b) already complained about Hagen's description: »Es kommt eine ähnliche Bewaffnung des Thorax nur bei *Nannophya Phryne* Perty und *Diplax bispina* Hagen vor. Letztere Art kommt nach Hagen (Stett. Zeit. 1867 p. 91) in Morotai und Nord-Halmaheira vor, ist aber nirgends beschrieben. Es wäre möglich, dass sie mit meiner Art zusammenfällt. Immerhin wird es leichter sein, diesen Namen nach meiner Beschreibung zu ändern, als für mich nach dem Namen die Bestimmung meiner Thiere durchzuführen.« In the interest of stability of nomenclature the Name *bispina* is to be conserved.

*Agrinoptera insignis quatuornotata* Brauer, 1867 (Fig. 1.4)

*Libellula insignis* Rambur, 1842. - Hist. nat. Ins. Névr.: 123.

*Agrinoptera quatuornotata* Brauer, 1867b. - Ver. zool.-bot. Ges. Wien, 17: 298 [♂, Menado (Celebes)].

*Agrionoptera insignis quatuornotata*. - Selys, 1878; Mitt. K. zool. Mus. Dresden, 3: 294 [»pars«].

*Agrinoptera insignis quatuornotata*. - Ris, 1910; Collns zool. de Selys Longchamps, 10: 138.

*Agrinoptera insignis quatuornotata*. - Lieftinck, 1962; Insects of Micronesia, 5(1): 64.

Specimen examined: ♂ Holotypus, HLMD-Odo-27-HT:

Label from Kaup's hand reads: »Agrinoptera 4 notata Brau., «, Menado.« Red label: ♂ Holotypus Agrinoptera quatuornotata Brauer, 1867; des. et det. W. Schneider 1997.

RIS (1910) was the first to attempt a subspecific classification of this widely distributed species, applying the available synonyms to geographical variation. Although listed as a subspecies of *insignis* in his account on the Odonata of Micronesia, LIEFTINCK (1962) believed *quatuornotata* to have reached specific status.

*Lathrecista asiatica pectoralis* (Kaup in Brauer, 1867) (Fig. 1.16)

*Libellula asiatica* Fabricius, 1798. - Ent. Syst. Suppl.: 283 [East Indies].

*Libellula pectoralis* Kaup in Brauer, 1867a. - Ver. zool.-bot. Ges. Wien, 17: 19 [male, Ceram].

*Agrionoptera pectoralis*. - Selys, 1878; Mitt. K. zool. Mus. Dresden, 3: 294.

*Lathrecista asiatica*. - Ris, 1910; Collns zool. de Selys Longchamps, 10: 130.

*Agrionoptera pectoralis*. - Selys, 1882; An. Soc. esp. Hist. nat., 11: 10 [Kaup as author].

*Lathrecista* [sic] (*Libellula*) *pectoralis*. - St. Quentin, 1970; Ann. Naturhistor. Mus. Wien, 74: 269.

*Lathrecista pectoralis*. - Schneider, 1995; Entomol. Z., 105: 255.

Specimens examined: ♂ Holotypus, HLMD-Odo-19-HT:

Label 1: ♂ *Libellula pectoralis* Kp Ceram [handwritten]. Label 2 (red): Holotypus ♂ *Lathrecista pectoralis* (Kaup in Brauer, 1867), det. W. Schneider 1997). - 1 ♀, HLMD-Odo-755: No original labels, but together with previous specimen. New label: ♀ *Lathrecista (asiatica) pectoralis* (Kaup in Brauer, 1867), Ceram? v. Rosenberg leg? - 1 ♀, NHMW, Inv.-Nr. 1054 (drawer 7|2): Label 1: Ceram [handwritten]. Label 2: *pectoralis* [handwritten], det. Brauer [printed]. Label 3: Orth. *Libellula pectoralis* Br. ♀ [handwritten]. Label 4: *asiatica* [handwritten], det. H. Zerny [printed]. - 1 ♂, NHMW (drawer 7|2): Label 1: Kaup, Menado, 1867 [handwritten]. Label 2: *pectoralis* det. Brauer [handwritten]. Label 3: *L. pectoralis* Brau., Celebes [handwritten]. Label 4: *asiatica* [handwritten], det. H. Zerny [printed]. - 1 ♂, NHMW (drawer 7|2): Label 1: Kaup, 1867, Menado [handwritten]. Label 2: *pectoralis* [handwritten], det. Brauer [printed]. Label 3: Menado, Duiven. [handwritten]. Label 4: *asiatica* [handwritten], det. H. Zerny [printed].

This taxon is at present considered as one of the valid subspecies of the widely distributed species *asiatica* (e.g. RIS 1910, LIEFTINCK 1930), although its taxonomy on the subspecific level is still to be settled.

The original description of *pectoralis* is clearly based on a single male specimen from Ceram, matching in every detail a male in Kaup's collection with a corresponding label. This is the holotype (by monotypy) of the taxon in question and is kept in the Hessian State Museum Darmstadt. It explains ST. QUENTIN'S (1970) statement: »Ein ♂ aus Ceram, wie bei Brauer angegeben, liegt nicht vor...« In Darmstadt there was a conspecific female (no labels) pinned next to the holotype, obviously not recognised as such by Brauer and therefore not described. For the same reason the other specimens in the Vienna Museum cannot have type-status – even though the labels suggest that Kaup had presented them to Brauer. This is confirmed by ST. QUENTIN'S (l.c.) statement: »... ein ♀ trägt die (sich widersprechenden) Herkunftsetiquetten »Ceram« und »Viti Levu«; diese wie andere von Brauer bestimmte Exemplare können höchstens als »typische Exemplare« gelten.« Another specimen mentioned by RIS (1910) as »Cotype« (ex Coll. Selys) has no type status at all.

*Protorthemis coronata* (Kaup in Brauer, 1866) (Fig. 1.1)

*Libellula coronata* Kaup in Brauer, 1866. - Ver. zool.-bot. Ges. Wien, 16: 365 [♂, ♀, Ceram].

*Orthemis coronata*. - Selys, 1878; Mitt. K. zool. Mus. Dresden, 3: 194.

*Protorthemis coronata*. - Ris, 1910; Collns zool. De Selys Longchamps, 10: 149.

*Protorthemis coronata*. - Ris, 1919; ibid, 16: 1070.

*Protorthemis coronata*. - Lieftinck, 1942; Treubia, 18: 474 [distribution].

*Protorthemis coronata*. - St. Quentin, 1970; Ann. Naturhistor. Mus. Wien, 74: 269.

*Protorthemis coronata*. - Schneider, 1995; Entomol. Z., 105: 255.

Specimen examined: 1 ♀, HLMD-Odo-4-ST: Label 1: ♀ *Libellula coronata* Kp. Ceram v. Ros. [handwritten]. Label 2 (red): Syntypus ♀, det W. Schneider 1997.

The syntype series consisted of one male and one female. The male is in fact not in the Vienna Natural History Museum (ST. QUENTIN 1970) and also not in the HLMD. The female syntype was found in Kaup's collection and agrees in every detail with the original description.

***Neurothemis decora*** (Kaup in Brauer, 1866)

(Figs 1.2 & 1.3)

*Polyneura decora* Kaup in Brauer, 1866. - Ver. zool.-bot. Ges. Wien, 16: 567 [♀♀, Ambon].

*Neurothemis decora*. - Brauer, 1867a; Ver. zool.-bot. Ges. Wien, 17: 5 & 11 [redescription].

*Neurothemis decora*. - Brauer, 1867b; Ver. zool.-bot. Ges. Wien, 17: 289.

*Neurothemis decora*. - Ris, 1911; Collns zool. de Selys Longchamps, 13: 557.

*Neurothemis decora*. - Lieftinck, 1942; Treubia, 18: 480.

*Neurothemis (Polyneura) decora*. - St. Quentin, 1970; Ann. Naturhistor. Mus. Wien, 74: 272 [? lectotype].

*Neurothemis decora*. - Schneider, 1995; Entomol. Z., 105: 255.

Specimens examined: ♀, Lectotypus, NHMW, Inv.-Nr. 1282 (drawer 8|33): Label 1: Amboina [handwritten]. Label 2: var. *decora* [handwritten] det. Brauer [printed]. Label 3: *Polyneura decora* Kaup ♀, Type, Amboina [handwritten]. Label 4: *decora* [handwritten] det. H. Zerny [printed]. Label 5 (red): Lectotype, *decora* Br, rev Lieftinck '60. Label 6 (red): vidi, W. Schneider, XII. 1999.. - 1 ♀, HLMD-Odo-5-PLT: Label 1: *Neurothemis decora* Kaup ♀ [handwritten]. Label 2 (red): Paralectotypus ♀, *Neurothemis decora* (Kaup in Brauer, 1866), des. & det. W. Schneider 1997. - 1 ♀, HLMD-Odo-6-PLT: Label 1: *decora* ♀, Amboina [handwritten]. Label 2 (red): Paralectotypus ♀, *Neurothemis decora* (Kaup in Brauer, 1866), des. & det. W. Schneider 1997.

The description of *decora* is based on females only. According to BRAUER (1866, 1867a), Amboina (Ambon) is terra typica; this was questioned by RIS (1911) and again by LIEFTINCK (1942); *N. decora* is probably restricted to New Guinea. In 1966 Lieftinck fixed a lectotype, a designation which was published by ST. QUENTIN (1970).

***Neurothemis ramburii*** (Kaup in Brauer, 1866)

(Fig. 1.19)

*Polyneura Ramburii* Kaup in Brauer, 1866. -

Ver. zool.-bot. Ges. Wien, 16: 568 [♂, Celebes].

*Neurothemis palliata* var. *Ramburii*. - Brauer, 1867a; Ver. zool.-bot. Ges. Wien, 17: 7 & 10.

*Neurothemis decora* [nec Kaup in Brauer, 1866]. - Selys, 1878; Mitt. K. zool. Mus. Dresden, 3: 294.

*Neurothemis palliata* var. *Ramburi*. - Ris, 1911; Collns zool. de Selys Longchamps, 13: 554.

*Neurothemis ramburi*. - Lieftinck, 1942; Treubia, 18: 482.

*Neurothemis (Polyneura) ramburii*. - St. Quentin, 1970; Ann. Naturhistor. Mus. Wien, 74: 271.

*Neurothemis ramburii*. - Schneider, 1995; Entomol. Z., 105: 255.

*Neurothemis ramburi*. - Steinmann, 1997; World Cat. Odo., 2: 461 [Type male: Darmstadt Mus.]

Specimen examined: ♂, HLMD-Odo-7-HT: Label 1: *Neurothemis Ramburii* Kp. Celebes Duiv. [handwritten]. Label 2 (red): Holotypus ♂ *Neurothemis ramburii* (Kaup in Brauer, 1866), det. W. Schneider 1997.

This taxon has long been placed in the synonymy of *palliata* Rambur, 1842 (which is a synonym of *fluctuans* Fabricius, 1793; vide LIEFTINCK 1942). *N. ramburii* is now considered a valid species with a wide distribution and several subspecies. Its description is based on a single, exceptionally large male, kept in the HLMD. BRAUER (1867a: 11) writes: »Das Exemplar ist auffallend groß.« In Vienna (drawer 8|34) there are two males pinned as *palliata* (»Kaup, Ceram«) which are noticeably smaller. This is also the case for other males (identified as *palliata*) from Ceram in Kaup's collection in Darmstadt. ST. QUENTIN's (1970) assumption that a male from Celebes in the NHMW (Inv.-Nr. 1281), identified as *palliata* Rambur by Brauer could be the type specimen is therefore not true.

***Neurothemis stigmatizans*** (Fabricius, 1775)

(Figs 1.8–1.15)

*Libellula stigmatizans* Fabricius, 1775. - Syst Ent: 412.

*Neurothemis Pseudosophronia* Brauer, 1867a. - Ver. zool.-bot. Ges. Wien, 17: 15 [♀♀, ♂♂, Ceram].

*Neurothemis innominata* Brauer, 1867a. - Ibid, 17: 17 [♀, Ceram].

*Neurothemis diplax* Brauer, 1867a. - Ver. zool.-bot. Ges. Wien, 17: 18 [♀, Ceram].

*Neurothemis oculata*. - Selys, 1878; Mitt. K. zool. Mus. Dresden, 3: 294 [*pseudosophronia*, *diplax*, *innominata* as synonyms of *oculata*].

Specimens examined: *N. pseudosophronia*: ♀ Lectotypus, NHMW, Inv.-Nr. 1602 (drawer 8|36): Label 1: Kaup Ceram 1867 [handwritten]. Label 2: *pseudosophronia oculata* [handwritten] det. Brauer [printed]. Label 3: *pseudosophronia* Brauer Type [handwritten]. Label 4: v. *manadensis* [handwritten] det. H. Zerny [printed]. Label 5 (red): ♀ Lectotypus *Neurothemis pseudosophronia* Brauer, 1867, W. Schneider, XII.1999. - 1 ♀ Paralectotypus, NHMW, same inventory number and depositary: Labels 1 to 4 as above. Label 5 (red): ♀ Paralectotypus *Neurothemis pseudosophronia* Brauer, 1867, W. Schneider, XII.1999. - 2 ♂♂, NHMW (drawer 8|36): label 1: Kaup, Ceram, 1867. Label 2: *manadensis elegans*, det. Brauer. Label 3: v. *manadensis*, det. H. Zerny. Label 4: vidi, W. schneider, XII.1999. - 4 ♂♂ Paralectotypi, HLMD-Odo-12-PLT1 to PLT4. HLMD-Odo-12-PLT1 with label: *Neuroth. Pseudosophronia* Br, Ceram, v.R. [handwritten]. All with identification label (red): ♂ *N. stigmatizans manadensis* (Boisduval, 1835), ♂ Paralectotypus *Neurothemis pseudosophronia* Brauer, 1867, des. & det. W. Schneider 1997. - 2 ♀♀ Paralectotypi, HLMD-Odo-16-PLT/-17-PLT. HLMD-Odo-17-PLT with label: *Neurothemis pseudosophronia* B, Ceram, v.R. [handwritten]. Both with identification label (red): ♀ *N. stigmatizans manadensis* (Boisduval, 1835), ♀ Paralectotypus *Neurothemis pseudosophronia* Brauer, 1867, des. & det. W. Schneider 1997. *N. innominata*: ♀ Holotypus, HLMD-Odo-11-HT: Label 1: *Neuroth. innominata* Br, Cer.N. Guinea R [handwritten]. Label 2 (red): ♀ Holotypus, *Neurothemis innominata* Brauer, 1867, det. W. Schneider. *N. diplax*: ♀ Holotypus, HLMD-Odo-18-HT: Label 1: *Neuroth. diplax* Br., N. Guinea Cer. R. [handwritten]. Label 2 (red): Holotypus ♀ *Neurothemis diplax* Brauer, 1867, det. W. Schneider 1997.

First I had in mind to follow RIS' concept (1911) and listed Brauer's nominal taxa under two subspecies of *stigmatizans*: *pseudosophronia* and *innominata* under *manadensis* Boisduval, 1835, and *diplox* under *bramina* Guérin, 1832. Taking into account that the specimens on which Brauer based his new taxa all have the same geographic origin (Ceram), I have decided for the time being to lump them all under *stigmatizans* Fabricius, 1775.

***Rhyothemis pygmaea*** (Brauer, 1867) (Fig. 1.17)

*Celithemis pygmaea* Brauer, 1867b. - Ver. zool.-bot. Ges. Wien, 17: 297 [♂, New Guinea].

*Rhyothemis pygmaea*. - Selys, 1878; Mitt. K. zool. Mus. Dresden, 3: 293.

Specimen examined: ♂ Holotypus (by monotypy), HLMD-Odo-22-HT: Label 1: *Celithemis pygmaea* Br, N. Guinea v.R. [handwritten]. Label 2 (red): Holotypus ♂, *Celithemis pygmaea* Brauer, 1867, det. W. Schneider 1997.

There has been little doubt on the validity and identity of this rather small species of *Rhyothemis*. As mentioned by BRAUER (1967b: 297) the prothorax of the single male is not well preserved and the head is glued to what remains of the prothorax: »Leider ist der Prothorax bei dem einzigen Stück nicht gut erhalten.«

***Tramea loewii*** Kaup in Brauer, 1866 (Fig. 2.1 & 2.2)

*Tramea Löwii* Kaup in Brauer, 1866. - Ver. zool.-bot. Ges. Wien, 16: 563 [♂♂, Ceram].

*Tramea Loewii*. - Selys, 1878; Mitt. K. zool. Mus. Dresden, 3: 293 [»Loewii Kaup, Brauer«].

*Tramea Loewi*. - Ris, 1913; Collns zool. de Selys Longchamps, 15: 975.

*Tramea loewi loewi*. - Lieftinck, 1942; Treubia, 18: 527 [Type material ex Mus. Vienna].

*Tramea loewi*. - St. Quentin, 1970; Ann. Naturhistor. Mus. Wien, 74: 275 [»Holotypus ♂, Allotypoid ♀«].

*Tramea loewii*. - Schneider, 1995; Entomol. Z., 105: 255.

*Tramea loewi*. - Steinmann, 1997; World Cat. Odo., 2: 549 [»Type male: not given, perhaps in Darmstadt Mus.«].

Specimens examined: 1 ♂ Syntypus, NHMW, Inv.-Nr. 1500 (drawer 10|19): Label 1: Kaup, Ceram, 1867 [handwritten]. Label 2: *Tramea Loewi* Brau., Type ♂ [handwritten]. Label 3: *Loewi*, det. Zerny. Label 4: ♂ Syntypus, *Tramea loewii* Kaup in Brauer, 1866, det. W. Schneider XII.1999. - 1 ♂ Syntypus, NHMW, same inventory number and depository: Label 1: *Loewi*, det. Zerny. Label 2: *Loewi* det. Brauer. Label 4: Kaup, Ceram, 1867. Label 4: Type. Label 5: *Tramea Löwii* K., Brauer. Type. Label 6 (rot): ♂ Syntypus *Tramea loewii* Kaup in Brauer, 1866, det. W. Schneider 16. XII.1999. - 1 ♂ Syntypus, HLMD-Odo-1-ST: Label 1: *Tramea Loewii* Kaup, Ceram v.R. [handwritten]. Label 2 (red): Syntypus ♂ *Tramea loewii* Kaup in Brauer, 1866, det. W. Sch. - 1 ♂ Syntypus, HLMD-Odo-2-ST: Label 1: *Löwi* ♂ [handwritten]. Label 2 (red): Syntypus ♂ *Tramea loewii* Kaup in Brauer, 1866, det. W. Sch.

There had been some confusion on the composition of the type series: BRAUER's (1866) description is based on males only. The confusion started with RIS (1913) who argued that two specimens from the Hamburg Museum could be Brauer's »Cotyphen«.

As one of these specimens is a female and both were not collected in Ceram by v. Rosenberg, they have no type status. In 1970 ST. QUENTIN listed under the inventory number 1500 a male holotype and a female »Allotypoid«. Both specimens (Natural History Museum Vienna) are males and clearly marked as types of *Tramea loewii* (kept in drawer 10|19 under the genus *Trapezostigma*). The type series therefore consists of four male syntypes, two in Vienna and two in Darmstadt.

***Tramea rosenbergi*** Brauer, 1866 (Fig. 2.6)

*Tramea Rosenbergi* Brauer, 1866. - Ver. zool.-bot. Ges. Wien, 16: 564 [♂, Ceram].

*Tramea Rosenbergii* [sic]. - Selys, 1878; Mitt. K. zool. Mus. Dresden, 3: 293 [»non vidi«].

*Tramea limbata* [nec Kirby, 1889]. - Ris, 1913; Collns zool. de Selys Longchamps, 15: 979, 985.

*Tramea rosenbergi*. - Lieftinck, 1942; Treubia, 18: 530.

*Tramea rosenbergi*. - Steinmann, 1997; World Cat. Odo., 2: 550 [»Type sex not given: lost«].

Specimen examined: ♂ Holotypus, HLMD-Odo-3-HT: Label 1: ♂ *Tramea Rosenbergi* Brauer, Ceram v.R. [handwritten]. Label 2: Holotypus ♂ *Tramea rosenbergi* Brauer, 1866., det. W. Schn. 1997.

As in other cases, BRAUER's (1866: 565) menticolous description proves that this specimen from Kaup's collection is the holotype (by monotypy): For example, the penile organ is bent and protruding between the hamuli which reads in the original: »Zwischen beiden der Penis hervortretend, gekniet.«

***Macrodiplax cora*** (Kaup in Brauer, 1867) (Fig. 2.3)

*Diplax Cora* Kaup in Brauer, 1867. - Ver. zool.-bot. Ges. Wien, 17: 20 [♀, Ceram].

*Macrodiplax Cora*. - Selys, 1878; Mitt. K. zool. Mus. Dresden, 3: 294 [»Kaup, Brauer«].

*Macrodiplax cora*. - Ris, 1913; Collns zool. de Selys Longchamps, 16: 1036.

*Macrodiplax cora*. - Steinmann, 1997; World Cat. Odo., 2: 557 [Type female: Naturhist. Mus., Wien].

*Macrodiplax cora*. - Schneider, 1995; Entomol. Z., 105: 255.

Specimen examined: ♀ Holotypus (by monotypy), HLMD-Odo-20-HT: ♀ *Diplax cora* Kp., Ceram v.R. [handwritten]. Label 2 (red): ♀ Holotypus *Macrodiplax cora* (Kaup in Brauer, 1867), det. W. Schneider 1997.

The female holotype was found in Kaup's collection (contra STEINMANN 1997) and is in perfect agreement with the original description (BRAUER 1867a), e.g. the anal appendages are broken (»Anhänge gebrochen, ...«).

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Fig. 1: Dragonfly collection of J.J. Kaup in the HLMD (box »46«, situation when found in 1995):

- (1) syntype of *Libellula coronata* (= *Protorthemis coronata*).
- (2) & (3) 2 paralectotypes of *Polyneura decora* (= *Neurothemis decora*).
- (4) holotype of *Agrionoptera quatuornotata* (= *A. insignis quatuornotata*).
- (5), (6), & (7) 3 paralectotypes of *Perithemis duivenbodei* (= *Brachydiplax duivenbodei*).
- (8) holotype of *Neurothemis innominata* (= *N. stigmatizans manadensis*).
- (9),(10),(11),(12),(13), and (14): 4 and 2 paralectotypes of *Neurothemis pseudosophronia* (= *N. stigmatizans manadensis*).
- (15) holotype of *Neurothemis diplax* (= *N. stigmatizans bramina*).
- (16) holotype of *Libellula pectoralis* (= *Lathrecista asiatica pectoralis*).
- (17) holotype of *Celithemis pygmaea* (= *Rhyothemis pygmaea*).
- (18) paralectotype of *Gynacantha rosenbergi*.
- (19) holotype of *Polyneura ramburii* (= *Neurothemis ramburii*).

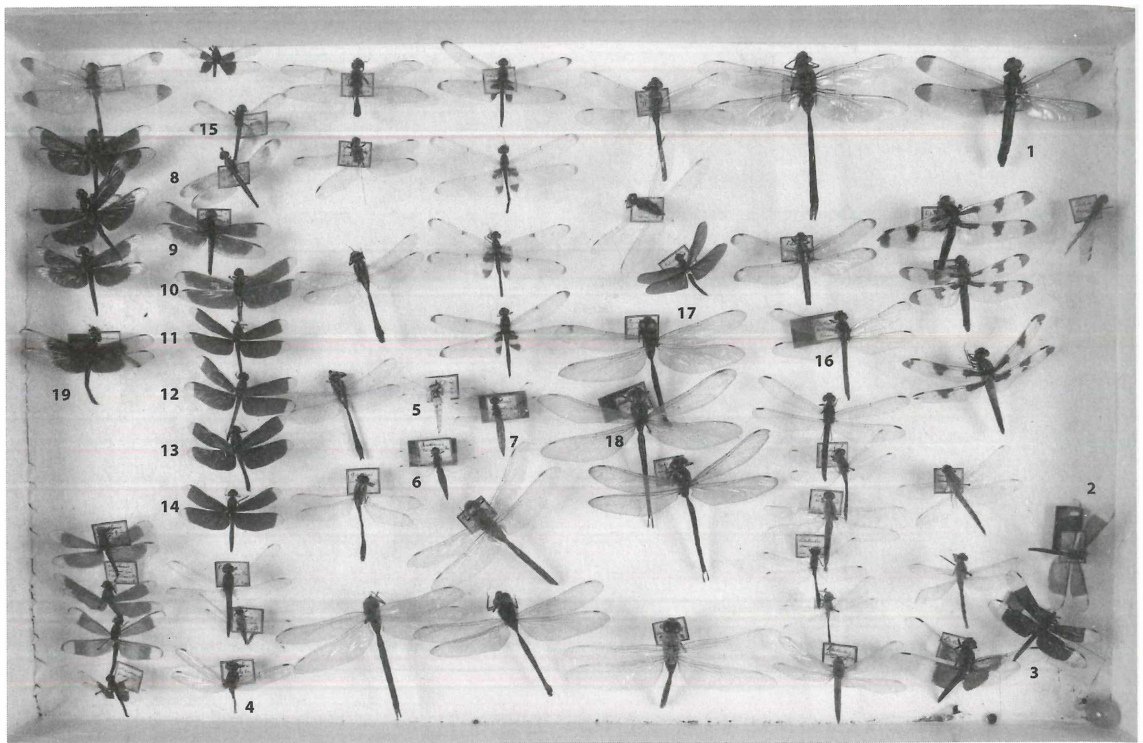
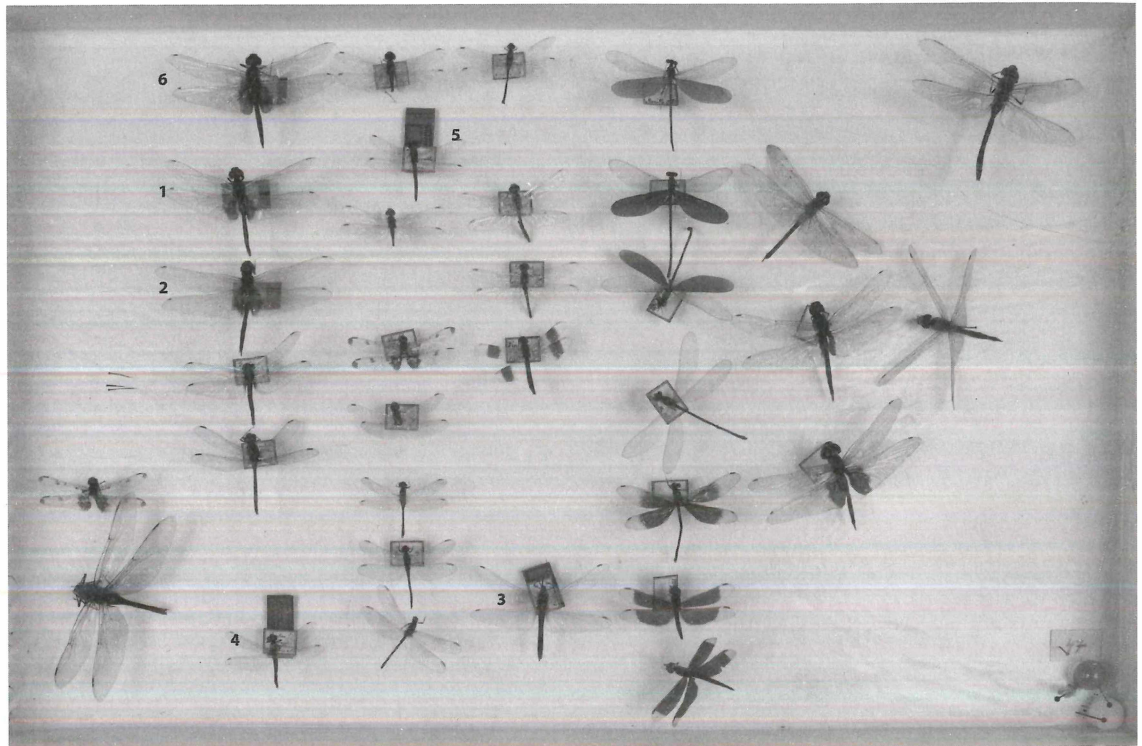
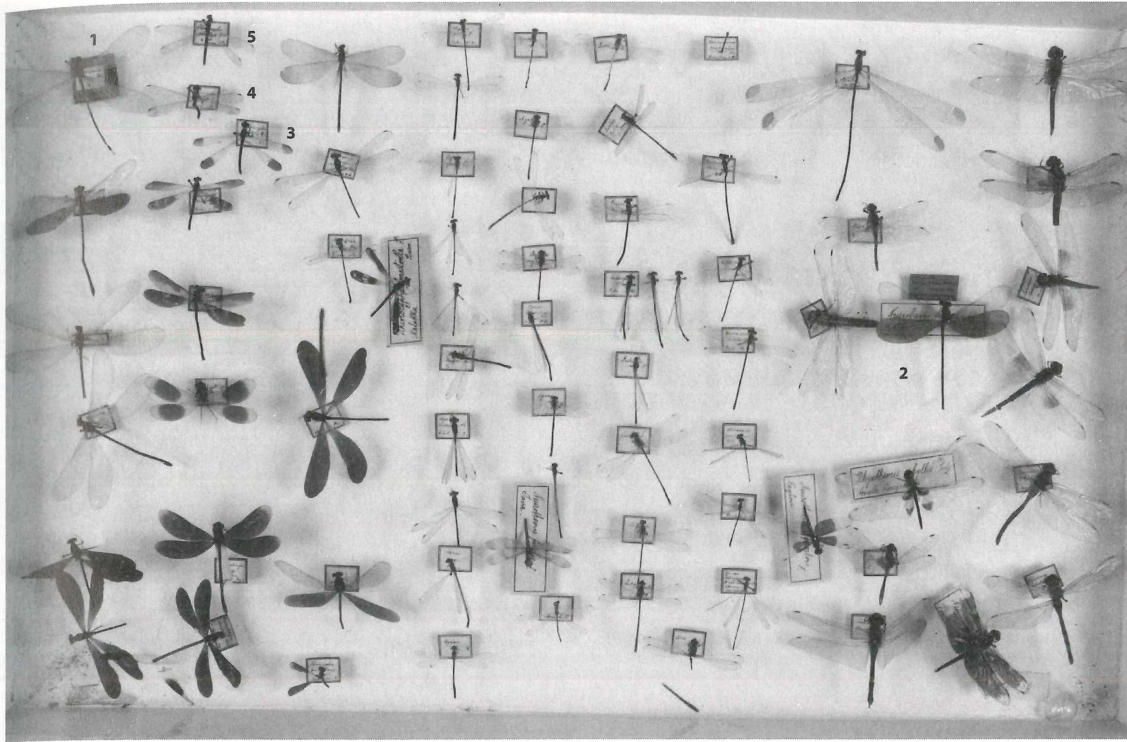


Fig. 2: Dragonfly collection of J.J. Kaup in the HLMD (box »47«, situation when found in 1995):

- (1) syntype of *Tramea loewii*.
- (2) syntype of *T. loewii*.
- (3) holotype of *Diplax cora* (= *Macrodiplax cora*).
- (4) holotype of *Diplax denticauda* (= *Brachydiplax denticauda*).
- (5) holotype of *Diplax thoracantha* (= *Raphismia bispina*).
- (6) holotype of *Tramea rosenbergi*.





**Fig. 3: Dragonfly collection of J.J. Kaup in the HLMD (box »48«, situation when found in 1995):**  
**(1) lectotype of *Neurobasis kaupi*.**  
**(2) paralectotype of *N. kaupi*.**  
**(3) syntype of *Rhinocypha ustulata*.**  
**(4) syntype of *Rh. ustulata*.**  
**(5) syntype of *Rh. ustulata*.**