Bohumil Němec and his millipede collection at the National Museum in Prague (Czechia), with notes on *Craspedosoma rawlinsii simplex* Němec, 1896

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Abstract. The present catalogue lists data from a total of 95 specimens from 22 species of the millipede collection by the Czech scientist Bohumil Němec (1873–1966) housed in the National Museum in Prague. The material was collected at the turn of the 19th and 20th century in the modern-day Czechia and contains syntypes of *Craspedosoma rawlinsii simplex* Němec, 1896 [= *Craspedosoma rawlinsii rawlinsii* Leach, 1814, syn. nov.] and *Julus* (*Leucojulus*) *coerulans* Němec, 1896 [= *Kryphioiulus occultus* (Koch, 1847)]. The problematic of spelling the name *rawlinsii* turned to be much complicated than previously thought. Thus, only the International Commission on Zoological Nomenclature will have to solve it. Until then, the prevailing usage of *rawlinsii* is to be maintained.

Abstrakt. Bohumil Němec a jeho sbírka mnohonožek v Národním muzeu v Praze (Česko), s poznámkami o poddruhu *Craspedosoma rawlinsii simplex* Němec, 1896. Tento katalog obsahuje údaje o 95 jedincích mnohonožek ze sbírky českého vědce Bohumila Němec (1873–1966) uložené v Národním muzeu v Praze. Materiál, čítající 22 druhů, byl sebraný na přelomu 19. a 20. století na území dnešního Česka a obsahuje syntypy dvou taxonů: *Craspedosoma rawlinsii simplex* Němec, 1896 [= *Craspedosoma rawlinsii rawlinsii* Leach, 1814, syn. nov.] a *Julus* (*Leucojulus*) *coerulans* Němec, 1896 [= *Kryphioiulus occultus* (Koch, 1847)]. Problematika způsob psaní jména *rawlinsii* je mnohem komplikovanější, než se dosud předpokládalo, a proto ji bude muset řešit Mezinárodní komise pro zoologickou nomenklaturu. Do uveřejnění jejího rozhodnutí doporučujeme zachovat běžný způsob psaní *rawlinsii*.

Keywords. Bohemia, Diplopoda, faunistics, historical records, synonymy, type specimens

1. Introduction

Professor Bohumil Němec (Fig. 1) was a famous Czech scientist, known world-wide as a plant physiologist. He was born on 12 March 1873 in the village of Prasek near Nový Bydžov and died on 7 April 1966 in Havlíčkův Brod. After graduating at the secondary school in Nový Bydžov in 1892, he started his studies at the Charles University in Prague. As his teacher was an outstanding professor František Vejdovský (1849–1939), Němec's first twelve publications were zoological (see DOSTÁL et al. 1966). Němec was collecting millipedes in the surrounding of both his home and Prague during that time. From six millipede species or subspecies described by him (NĚMEC 1895a, b, 1896), two [*Choneiulus palmatus* (Němec, 1895b) and *Leptoiulus proximus* (Němec, 1896)] are still valid. Further relevant information can be found e.g. in MILOVIDOV (1958), HAVEL (1966), KLÁŠTERSKÝ (1967), KLOZ (1973), and WINTERS (2002).

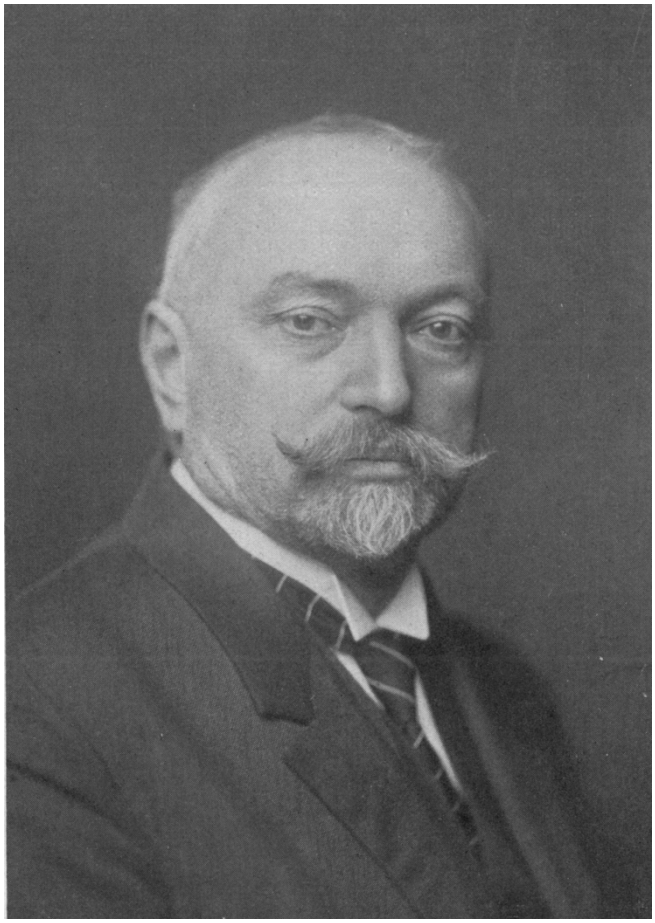


Figure 1: Bohumil Němec (1873–1966). Photo: Archive of the Department of Zoology, National Museum, Prague.

Němec's millipede collection contains 95 specimens, representing 22 species from the orders Polyxenida, Glomerida, Polyzoniida, Chordeumatida, Julida, and Polydesmida. Those originated from Prague and were revised by the second author earlier (KOCOUREK 2013). Němec's collection contains also syntypes of *Craspedosoma rawlinsii simplex* Němec, 1896 [= *Craspedosoma rawlinsii rawlinsii* Leach, 1814, syn. nov.] and *Julus* (*Leucojulus*) *coerulans* Němec, 1896 [= *Kryphioiulus occultus* (Koch, 1847)]. Unfortunately, syntypes of the valid species *Choneiulus palmatus* (Němec, 1895b) and *Leptoiulus proximus* (Němec, 1896) were not found and are considered to be lost. The type material of *Craspedosoma rawlinsii simplex* contains only a single female, thus not enabling to make any decision on status of the subspecies based on the type material. To solve its status, additional fresh material (including males) had to be collected from the type localities enabling comparison of male gonopods.

The National Museum also hosts some private millipede collections by the arachnologist František Miller, whose collection was partly catalogued (KOCOUREK & DOLEJŠ 2016), by the entomologist Augustin Hoffer, whose entire collection was catalogued (DOLEJŠ & KOCOUREK 2018), and by the myriapodologists Karl W. Verhoeff. The collection of Bohumil Němec is thus an important part of the series of collections that have belonged to famous personalities.

2. Material and Methods

All millipede specimens are maintained in 80 % ethanol. All of them were revised by the second author. The nomenclature and arrangement of orders follow those of KOCOUREK et al. (2017). Species within the orders are sorted alphabetically.

The data is arranged as follows: Inventory number: Loc. = number of Němec's locality (details on localities are given in Tab. 1) – number and sex of specimens. Exact collecting dates of most of the samples are unknown; part of the material had been collected during 1894–1896 (NĚMEC 1896) and subsequently deposited in the National Museum in 1897.

The present administrative divisions of Europe are used. The grid squares for Czechia (Fig. 2) follow BUCHAR (1982) and PRUNER & MÍKA (1996). Images of selected specimens and gonopods were made using an Olympus SZX16 stereomicroscope equipped with an Infinity 2 camera and a motor focusing CB-ZM. For SEM examination, the gonopods were transferred from ethanol into acetone, air-dried, coated with gold, and inspected using a scanning electron microscope (HITACHI S-3700N). Terminology of the gonopods follows that of TADLER (1993).

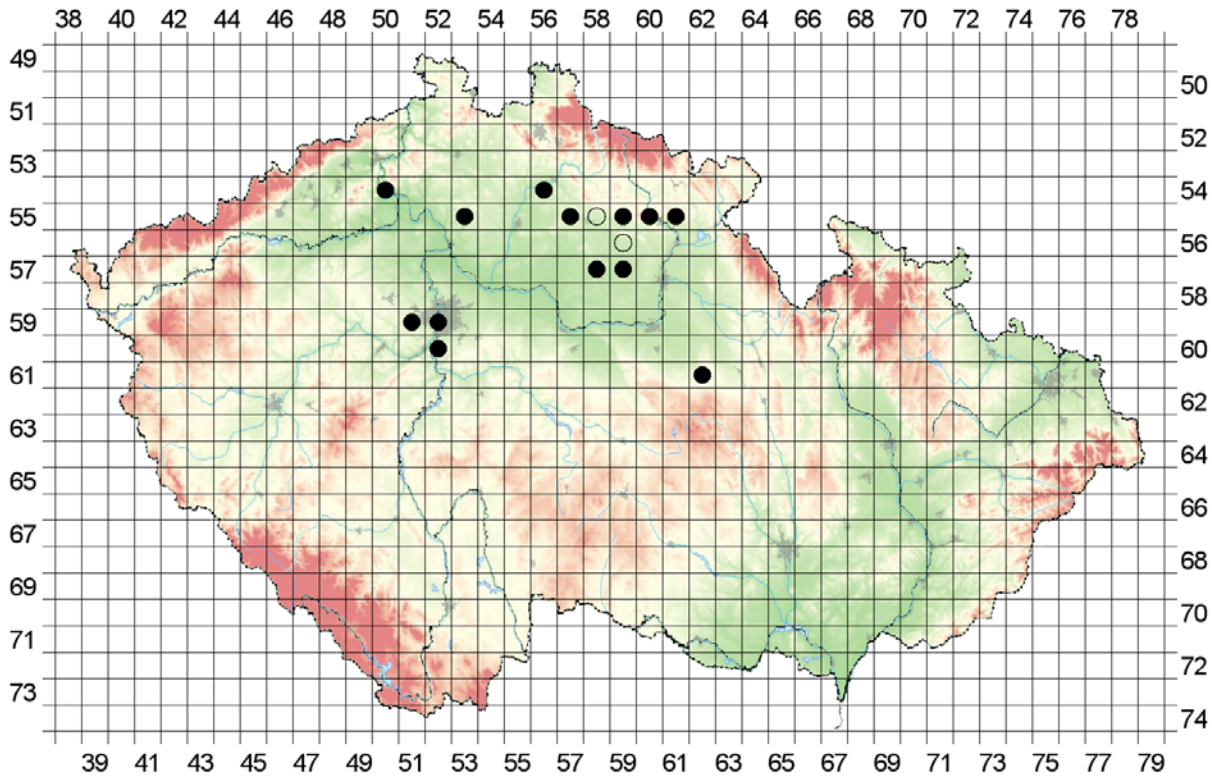


Figure 2: Map of localities where Němec collected the millipedes in Czechia (empty circle = locality known only from literature but no material is available). Created by online application BIOLIB (2018) website.

Table 1: Characteristics of Němec's localities.

Locality number	Name of locality	Approximate coordinates	Grid square	Altitude (m)
1	Dolní Břežany – Jarov	49.954°N; 14.395°E	6052	220
2	Dvůr Králové nad Labem	50.432°N; 15.814°E	5560–5561	298
3	Kokořín	50.430°N; 14.567°E	5553	333
4	Lázně Bělohrad, Černé jezero Lake	50.425°N; 15.600°E	5559	297
5	Litoměřice	50.533°N; 14.132°E	5450	136
6	Luže	49.893°N; 16.028°E	6162	300
7	Nový Bydžov	50.242°N; 15.491°E	5758–5759	232
8	Praha – Chuchle	50.020°N; 14.386°E	5952	300
9	Praha – Košíře, forest on the ride side of the road	50.064°N; 14.354°E	5952	300
10	Praha – Krč	50.041°N; 14.448°E	5952	220
11	Praha – Liboc	50.094°N; 14.320°E	5951	325
12	Praha, Štvanice Island	50.096°N; 14.439°E	5952	194
13	Praha [without exact locality]	–	5952	–
14	Sobotka	50.467°N; 15.176°E	5557	305
15	Turnov, Valdštejn Castle	50.562°N; 15.167°E	5456	380
16	Žernoseky	50.539°N; 14.064°E	5450	150-200

3. Catalogue of the millipedes

Order Polyxenida Lucas, 1840

Polyxenus lagurus (Linnaeus, 1758): P6E 4087: Loc. 7 – 4 ♀♀.

Order Glomerida Leach, 1908

Glomeris tetrasticha Brandt, 1833: P6d-57/2016: No collecting data – 2 ♂♂, 2 ♀♀.

Trachysphaera acutula (Latzel, 1884): P6E 4106: Loc. unknown (apparently not from Czechia) – 3 ♂♂, 2 ♀♀, 1 juv. (Fig. 3).

Order Polyzoniida Gervais, 1844

Polyzonium germanicum Brandt, 1837: P6E 4098: Loc. 7 – 1 ♀, 1 juv; P6E 4107: Loc. 7 – 2 ♀♀, 1 juv.

Order Julida Leach, 1814

Blaniulus guttulatus (Fabricius, 1798): P6d-57/2016: No collecting data – 4 ♂♂, 5 ♀♀, 6 juv.

Cylindroiulus luridus (C. L. Koch, 1847): P6E 4105: Loc. 10 – 1 ♀.

Enantiulus nanus (Latzel, 1884): P6E 4092: Loc. 2 – 2 ♀♀; P6E 4093: Loc. 12 – 1 ♂.

Julus (*Leucojulus*) *coerulans* Němec, 1896: Now: *Kryphioiulus occultus* (C. L. Koch, 1847)

P6E 4095: Loc. 11 – 1 ♀ (syntype, Fig. 4).

Figure 3: *Trachysphaera acutula* (Latzel, 1884), male and female (P6E 4106).

Figure 4: *Julus* (*Leucojulus*) *coerulans* Němec, 1896, female syntype (P6E 4095).

Julus scandinavius Latzel, 1884: P6E 4109: Loc. 8 – 1 ♂.

Megaphyllum projectum Verhoeff, 1894: P6E 4094: Loc. 5 – 1 ♀; P6E 4102: Loc. 16 – 1 ♀; P6E 4103: Loc. unknown (labelled „241") – 1 ♀.

Megaphyllum unilineatum (C. L. Koch, 1838): P6E 4096: Loc. 8 – 1 ♂; P6E 4110: Loc. 4 – 2 ♀♀.

Nopoiulus kochii (Gervais, 1847): P6E 4101: Loc. 14 – 1 ♀; P6E 4111: Loc. 9 – 1 ♂.

Ommatoiulus sabulosus (Linnaeus, 1758): P6E 4097: Loc. 8 – 1 ♂; P6E 4112: 27.V.1901, Loc. 15 – 1 ♀; P6E 4113: 1.VI.1903, Loc. 3 – 3 ♀♀; P6d-57/2016: No collecting data – 3 ♀♀.

Unciger foetidus (C. L. Koch, 1838): P6E 4100: Loc. unknown (labelled „237") – 1 ♂, 1 ♀; P6E 4104: Loc. 13 – 2 ♀♀; P6d-57/2016: No collecting data – 1 ♂, 1 ♀.

Order Chordeumatida Koch, 1847

Craspedosoma rawlinsii simplex Němec, 1896: Now: *Craspedosoma rawlinsii rawlinsii* Leach, 1814, syn. nov.; P6E 4090: Loc. 1 – 1 ♀ (syntype, Fig. 5).

Haasea germanica (Verhoeff, 1901): P6E 4108: Loc. unknown (label unreadable) – 1 ♀.

Mastigona bosniensis (Verhoeff, 1897): P6E 4091: Loc. 2 – 1 ♀.

Mycogona germanica (Verhoeff, 1892): P6d-57/2016: No collecting data – 1 juv.

Order Polydesmida Leach, 1815

Brachydesmus superus Latzel, 1884: P6E 4088: Loc. 11 – 1 ♂.

Polydesmus complanatus (Linnaeus, 1761): P6E 4099: 14.I.1892, Loc. unknown (labelled "224") – 1 juv.; P6d-57/2016: No collecting data – 9 ♂♂, 5 ♀♀, 1 juv.

Polydesmus denticulatus C. L. Koch, 1847: P6E 4089: Loc. 7 – 1 ♀.

Polydesmus sp.: P6E 4114: Loc. 9 – 7 juv.

Strongylosoma stigmatosum (Eichwald, 1830): P6E 4115: Loc. 6 – 1 ♂; P6d-57/2016: No collecting data – 2 ♂♂, 1 ♀.

4. Discussion

4.1. Synonymy of *Craspedosoma rawlinsii simplex* Němec, 1896

Bohumil NĚMEC (1896: 1) described the new subspecies based on three morphological differences on male gonopods that separated it from *Craspedosoma rawlinsii rawlinsii* Leach, 1814 and *Craspedosoma rawlinsii simile* Verhoeff, 1891. Since its description, *C. rawlinsii simplex* was never cited in any work and BEZDĚK (2011: 102) treated it thus as *nomen dubium*.

The main diagnostic character was a different size ratio of the syncoxit of the anterior gonopods to the cheirits; the syncoxit of the anterior gonopods being much larger than the cheirits (Figs. 6–9). On NĚMEC's (1896) Fig. 1 (Fig. 14), however, a basal part of the anterior gonopod (the part that is in contact with the cheirit) is apparently missing, causing the different ratio.

The second diagnostic character was the shape of pseudoflagellum deriving from the syncoxit and ending by a sharp point (Fig. 11). However, HAUSER (2004: 8) demonstrated that number of points at the end of pseudoflagella differs and the character is thus of no taxonomical value.

The third diagnostic character was the shape, granulation and ratios of processes size of the podosternite (Figs. 10, 12, 13). As HAUSER (2004) clearly show, that shape of podosternite and processes ratio depend on the angle of view and cannot be thus treated as a character for differential diagnosis. The same granulation is present on podosternites of *C. rawlinsii rawlinsii* as well.

In addition, NĚMEC (1896: 3) mentioned in his note that *C. rawlinsii simplex* is an intermediate form between *C. rawlinsii rawlinsii* and *C. rawlinsii simile*. Nowadays, the latter is a synonym of the former (SCHUBART 1964: 7), thus synonymization of *C. rawlinsii simplex* can be considered just a formal nomenclatoral act.

However, to support the above-mentioned conclusions, inspection of the type material seemed to be necessary. As the only existing syntype of *C. rawlinsii simplex* is a female indistinguishable from *C. rawlinsii rawlinsii*, we decided to collect fresh material from two type localities of *C. rawlinsii simplex*:

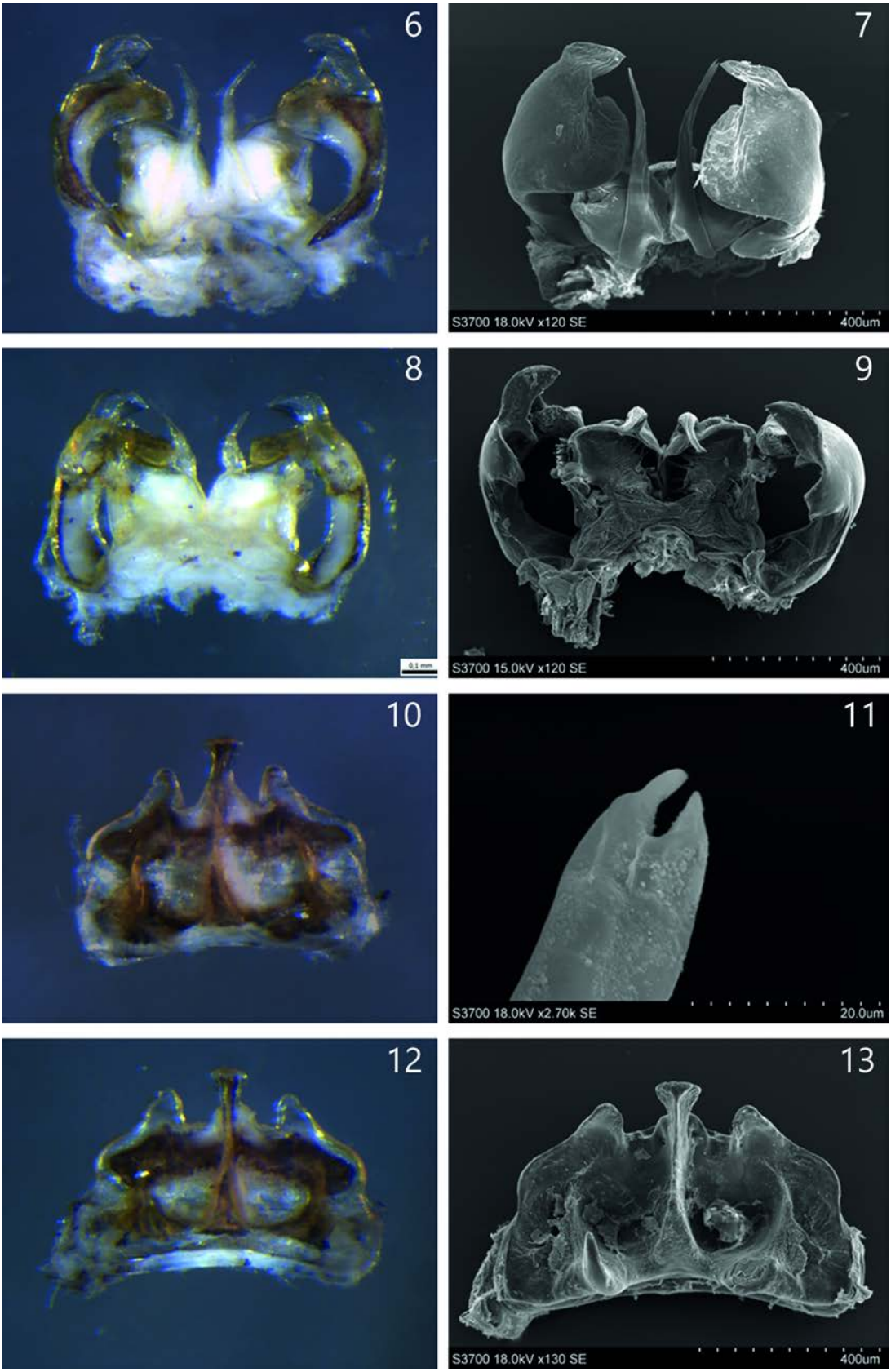
P6E 4906: Czechia, Dolní Břežany – Jarov, Károvské údolí Valley (49.957°N, 14.401°E, 220 m a. s. l., grid square 6052), 24.III.2018, 4 ♂♂, 1 ♀, leg. P. Dolejš & K. Rückl, det. P. Dolejš.

P6E 4907: Czechia, Ohrobec – Károv, Jarovské údolí Valley (49.943°N, 14.422°E, 315 m a. s. l., grid square 6052), 29.III.2018, 4 ♂♂, 5 ♀♀, leg. & det. P. Dolejš.

Examination of males from both localities (Figs. 6–13) revealed that they do not differ in any characters from *C. rawlinsii rawlinsii*.

After analyses of NĚMEC's (1896) description and drawings (Fig. 14) as well as inspection of males from two type localities of *C. rawlinsii simplex*, we conclude that *C. rawlinsii simplex* Němec, 1896 is a subjective junior synonym of C*. rawlinsii rawlinsii* Leach, 1814.

Figure 5: *Craspedosoma rawlinsii simplex* Němec, 1896, female syntype (P6E 4090).



Figures 6–13: *Craspedosoma rawlinsii*, gonopods from males from the type localities. 6–7, 10–11: Jarovské údolí Valley (frontal view); 8–9, 12–13: Károvské údolí Valley (8–9: caudal view, 12–13 frontal view). 6–9: Syncoxites; 10, 12–13: Podosternits; 11: Detail of the tip of pseudoflagellum.

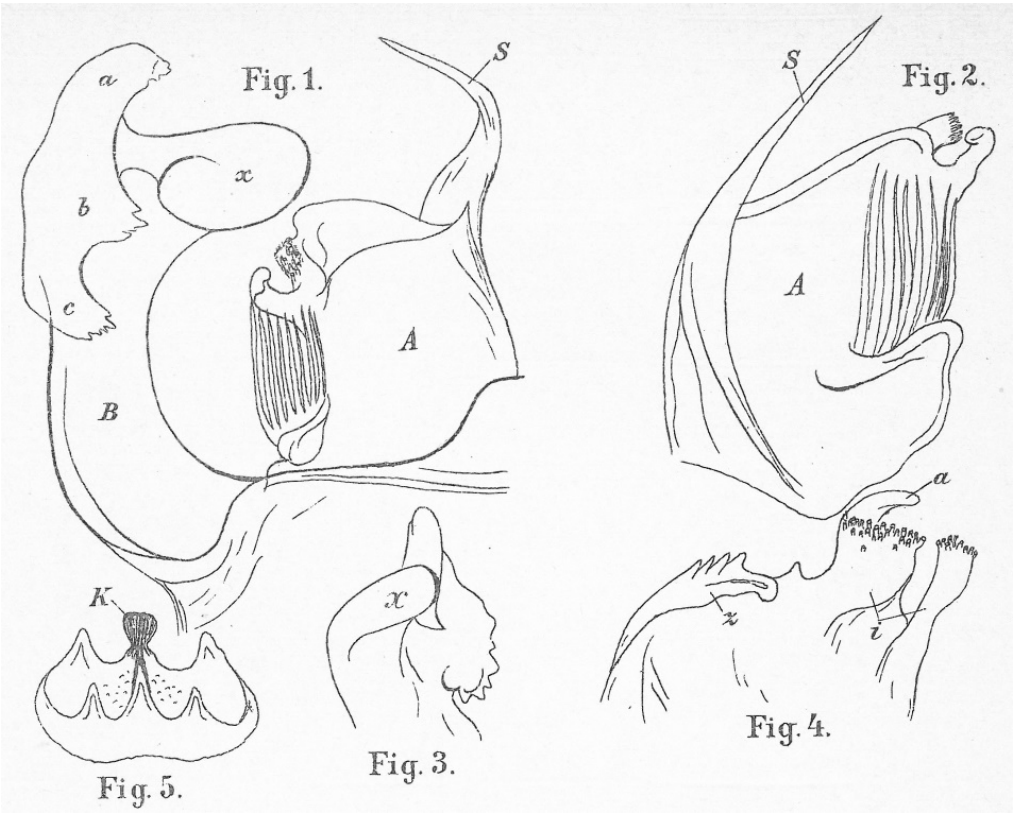


Figure 14: Drawings of *Craspedosoma rawlinsii simplex* gonopods from the original description by Bohumil Němec: 1, 2: anterior gonopod from caudal view (A – syncoxit, B – cheirit, S – pseudoflagellum; a – terminal projection, b – middle projection, c – clasping projection, x – transverse bulge); 3: Cheirit (x – transverse bulge); 4: Detail of the syncoxit (a – leaning tooth, i – lobular papillae, z – serrated margin of the syncoxit); 5: Podosternite from caudal view (K – posterior medial projection).

4.2. Spelling of *Craspedosoma rawlinsii* and *C. raulinsi*

Recently, MCALPINE & SHEAR (2018) brought seemingly reasonable arguments that the correct spelling of the species should be *raulinsii* as this spelling was used in the original (though generally overlooked) description. On the other hand, the International Commission on Zoological Nomenclature (1999) does not serve only the principle of priority, but – and namely – the stability of zoological nomenclature (Preamble and Article 23.2.). However, the situation is even much more complicated. LEACH (1814: 407) described the species as *raulinsii* and subsequently, in LEACH (1816 ["1815"]: 380), as *rawlinsii*. However, in the former work (published in 1814), he refers to his latter work (from 1815 but published physically in 1816): "*Craspedosoma Raulinsii*. Leach's MSS." Thus, the original description was obviously planned to be published in the work of LEACH (1816 ["1815"]) that was, unfortunately, published with a delay. The second problem is that both descriptions (LEACH 1814: 407 and 1815: 380) differ notably. Thus, from the formal point of view, these two descriptions can be treated as descriptions of two independent, separate species: *Craspedosoma raulinsii* Leach, 1814 and *Craspedosoma rawlinsii* Leach, 1816 ["1815"]. The third problem, not related to the previous ones, is whether to write the name with -ii or -i at its end (Article 33.4.). To sum up, it seems that for the definitive solution of this peculiar situation, a submission of a Case to the International Commission on Zoological Nomenclature would be necessary (Article 23.9.3.). Until the definitive solution, we use the commonly used spelling *rawlinsii* (Article 82.1.).

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