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## ***Ursus spelaeus* ROSENmüLLER 1794 and not ROSENmüLLER & HEINROTH - Johann Christian Rosenmüller, his life and the *Ursus spelaeus***

### **Zusammenfassung:**

Die Biographie von J. C. Rosenmüller belegt, dass die Aufstellung der Art *Ursus spelaeus* 1794 im Rahmen der eigenständigen Dissertation von J. C. Rosenmüller zum Dr. phil. erfolgte und keine Gemeinschaftsarbeiten von J. C. Rosenmüller und J. C. A. Heinroth war. Aus diesem Grund ist die Nennung *Ursus spelaeus* ROSENmüLLER & HEINROTH 1794 falsch. Nur die Nennung *Ursus spelaeus* ROSENmüLLER 1794 ist richtig und sollte deshalb Verwendung finden.

### **Abstract:**

The biography of J. C. Rosenmüller clearly illustrates that the holotype of the species *Ursus spelaeus* was the object of his first dissertation for a philosophical doctorate. Because dissertations are the intellectual properties of individual researchers (now and then), only Rosenmüller's name can rightfully be attached to the species *Ursus spelaeus* if following the rules of binominal classification. Neither *Ursus spelaeus* ROSENmüLLER & HEINROTH 1794, nor any other names, like Blumenbach or Cuvier, are historically correct and should not be used any further.

### **Résumé:**

La biographie de J. C. Rosenmüller prouve que la création de l'espèce *Ursus spelaeus* 1794 a été faite dans le cadre d'une dissertation indépendante de J. C. Rosenmüller pour l'obtention du grade Dr. phil. et non avec la collaboration de J. C. A. Heinroth. Pour cette raison, la dénomination *Ursus spelaeus* ROSENmüLLER & HEINROTH 1794 est fausse. Seule la dénomination *Ursus spelaeus* ROSENmüLLER 1794 est juste et doit donc être employée.

**Key words:** Johann Christian Rosenmüller, *Ursus spelaeus*



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Fig. 1: Johann Christian Rosenmüller (1771-1820) by Johann Friedrich Schröter. (Original at the Germanisches Nationalmuseum Nürnberg)

Johann Christian Rosenmüller (Fig. 1) was born May 25th, 1771 in Heßberg near Hildburghausen as the second son of Reverend Johann Georg Rosenmüller (1736-1815). We know of two brothers of Johann Christian: the three years older Ernst Friedrich Karl (1768-1835), who later made his career as an orientalist and professor of oriental languages at the University of Leipzig, and the four years younger Georg Hieronymus (1775-1825), who later became reverend at Oelzschau, a village near Leipzig.

The six year old Johann Christian started school in 1777 at Königsberg and later continued at Erfurt. Nothing more is known about these years (KLUGHARDT & ROSENDAHL 2000). In 1785 Johann Christian's father, who had been teaching in Gießen, received a call to the University of Leipzig to take up a professorship in theology. A year later, in 1786, Johann Christian joined his father there and enrolled at the University on May 19<sup>th</sup>.

In 1792 Johann Christian earned the academic degree of a Magister artium. In April of the same year he went to the University of Erlangen to study medicine. Erlangen became the basis for his later activities where he began to explore the countryside around Muggendorf, visiting caves. The book „Ausführliche Nachricht von neuentdeckten Zoolithen unbekannter vierfüssiger Thiere“, published in 1774 by Reverend Johann Friedrich Esper (1732-1781) that had made the region, its caves and its fossil bones famous all over educated Europe, also kindled Johann Christian's interest in vertebral palaeontology. For certain Johann Christian made the acquaintance of Jakob Friedrich Isenflamm, who was a physician and professor of anatomy at the University of Erlangen. Isenflamm had translated Esper's book into French as a student in 1775, and thus had contributed to the Europe-wide distribution of this seminal work.

This contact and the vicinity to the „Muggendorfer Gebirge“ (the mountains of Muggendorf) must have been enough motivation for Rosenmüller to explore the region more closely. Already, on October 18th. 1792, he explored the 16 m deep entrance pit of a cave „mit Beyhülfe einiger Leute aus dem Dorfe allein an einem Seile“ (with the help of some people from the village alone on a rope) (ROSENmüLLER 1793, 576). This cave had been discovered in 1790 by the cave inspector Johann Ludwig Wunder (1771-1819) during his ramblings around Muggendorf. Johann Gottfried Koeppe noted in 1795: „Herr Prosector Rosenmüller zu Leipzig war ... der erste Fremde, der sie bestieg; und seitdem ist sie unter dem Namen Rosenmüllershöhle schon allgemein bekannt“ (The Prosector [an academic title] Rosenmüller from Leipzig was ... the first foreigner to scale the cave that is commonly known since as Rosenmüllershöhle) (KOEPEL 1795, 11). This name it still retains today.

Even though Rosenmüller already left Erlangen in 1794 when he changed to the University of Leipzig, he kept himself busy with fossil remains of the Franconian bone caves. This is illustrated by the fact that he chose to investigate a well preserved bear skull from the Zoolithenhöhle for his „dissertatio“. He submitted it on October 22<sup>nd</sup>, 1794, to be rewarded with the academic title of a „Doktor der Weltweisheit“ of the Philosophical Faculty at the University Leipzig. In today's terms Rosenmüller acquired the title of a Doctor of Philosophy (Dr. phil. or PhD).

The complete title of the dissertation in Latin is „*Quaedam de ossibus fossilibus animalis cuiusdam, historiam eius et cognitionem accuratiorem illustrantia, dissertatio, quam d. 22. Octob. 1794 ad disputandum proposuit Ioannes Christ. Rosenmüller Heßberga-Francus, LL.AA.M. in Theatro anatomico Lipsiensi Prosector assumto socio Io. Chr. Aug. Heinroth Lips. Med. Stud. Cum tabula aenea*“. With this paper Rosenmüller established a new species according to the Linnaean rules.

In 1774 Esper had already recognized correctly that the remains of the „unknown creatures“ from the Zoolithenhöhle (known in English literature also as Gailenreuther Höhle) did not derive from the brown bear (*Ursus arctos*). Because he was lacking comparative material he had instead associated the bones with those of the polar bear (*Ursus maritimus*). Other authors had also noticed that the fossils were not compatible with the bones of the brown bear (KEMPE et al. 2005). It was left for Rosenmüller to make the long overdue step in 1794 to give the new species its name. Because these bear bones were known only from caves, he called the new species - in a mixture of Latin and Greek - *Ursus spelaeus*. According to the rules of the zoological nomenclature that were established by Carl v. Linné in 1758 the name of a species is followed by that of the first author describing it plus the year of the publication. In case of the cave bear the correct name therefore is: *Ursus spelaeus* ROSENMÜLLER 1794. The skull which Rosenmüller depicted 1794 on the copperplate (tabula aenea) is the holotype and the Zoolithenhöhle at Burggailenreuth (Franconian cave identification D 109) is the type locality. Supposedly the holotype is deposited at a scientific museum or magazine. The original cave bear skull of Rosenmüller is, however, lost.

In several publications, *Ursus spelaeus* is also associated with the names „ROSENMÜLLER & HEINROTH 1794“, as first authors. This is not correct because Johann Christian August Heinroth (17.1.1773 - 26.10.1843) is named in the title of Rosenmüller's dissertation as an assisting student of medicine, present during the presentation, but not as the earner of an academic title. In 1794, Heinroth was medical bachelor at the University of Erlangen and submitted his own dissertation (Dr. med.) 1805 at the University of Leipzig (<http://www.uni-leipzig.de/~psy/heinr.html>). Only Rosenmüller earned an academic degree and therefore *Ursus spelaeus* ROSENMÜLLER 1794 is the only correct species name of the cave bear. Also incorrect is *U. spelaeus* BLUMENBACH, which is sometimes found in the literature (e.g., TOULA 1900, 336). For an explanation of how this misinformation arose in the literature compare KEMPE et al. (2005).

Rosenmüller made a steep career as a physician at the University of Leipzig. In 1794 he already became Prosector, i.e., a doctor who can conduct vivisections, and Professor for Medicine in 1795. Even though, he had enough time to conduct further research on the cave bear. In 1795 he published an enlarged version of his holotype description of 1794 under the title „*Beiträge zur Geschichte und näheren Kenntniß fossiler Knochen*“ (Contributions to History and Detailed Knowledge of Fossil Bones). In this second paper Rosenmüller repeats that *U. spelaeus* obtained its name

rightfully because of the ubiquitous presence of its bones in caves. He even takes the step to outspokenly reject the hypothesis that their presence is due to deluge-like floods, an explanation widely spread in science of those days. Instead he said: „we can explain the large amounts of fossil bones easily by assuming that the animals, to which the bones belong, lived in the caves, reproduced there and to a large part died there“ (ROSENmüLLER 1795, 76 & 87). Nevertheless Rosenmüller knew that the cave bear, just as any other bear, spend most of their lives outside of the cave.

Rosenmüller's research on the Franconian bone caves forms the backbone of all of his speleological publications. This was, in spite of his occupation first as a professor at the University of Leipzig, until 1797, then as a general practitioner and finally as the physician for the garrison (since 1799). Over and over again he occupied himself with the bone caves of the „Muggendorfer Gebirg“, as he called the region. The title of his 1796 published paper „*Abbildung und Beschreibungen merkwürdiger Hölen um Muggendorf im Bayreutischen Oberlande für Freunde der Natur und Kunst*“ (Figures and descriptions of curious caves around Muggendorf in the Bayreuth region for the friends of nature and art) sounds like an encompassing program for a long series of papers. As the first contribution he announced a description of the „Höle bey Mockas“ (Cave of Mockas). Rosenmüller intended to present all of the 19 then known caves from Muggendorf and the further surroundings with „figures and descriptions and at the end to add a general overview of the statistical and natural science curiosities of the entire region“. He then stated that „the fate of the first edition will decide if the entire undertaking finds applause and if it is possible at all“ (ROSENmüLLER 1796, V). It turned out that the first contribution was also the last of the cave monographies.

In 1796 Rosenmüller earned a second doctoral degree as a medical doctor (Dr. med; MD) with a dissertation entitled „*Organorum lathrymalium partiumque externatum oculi humani descriptio anatomica*“ (ROSENDahl & KEMPE 2004). Together with Wilhelm Gottlieb Tilesius (1769-1857, who later earned world fame as participant of the first Russian circumnavigation of the globe 1803-1806 under Captain Adam Johann Krusenstern, and who published the history of the discovery of Adam's Mammoth) Rosenmüller collated 1799 and 1805 two volumes of cave descriptions including copperplates entitled: „*Beschreibung merkwürdiger Höhlen. Ein Beitrag zur physikalischen Geschichte der Erde*“ („*Description of Curious Caves, a Contribution to the Physical History of the Earth*“). In 1802, when Rosenmüller was awarded with the Assistant Professorship for Anatomy and Chirurgy of the University of Leipzig another review about dripstone („*Über getraufte Steine*“) followed.

After Prof. Hebestreits died, Rosenmüller finally became full professor for Anatomy and Chirurgy and member of the medical faculty of the University of Leipzig in 1804.

In the same year the final cave-related paper was published including „*Figures and descriptions of fossil bones of the cave bear*“. It dealt with the investigation of the not yet published parts of the cave bear skeleton.

From 1804 to 1809 Rosenmüller was University Physician in Leipzig, a position, which he quitted when he became the physician of the Faculty of Law. In 1811 he was awarded the title of a Royal Saxonian Hofrat. In 1819, a year before he died, he became 3<sup>rd</sup> Professor for Medicine of the Anatomy at the University of Leipzig. In the same year he was honored by the title of a Knight of the Royal-Saxonian Civil Service which gained him the status of a baron.

In the night from the 28<sup>th</sup> to 29<sup>th</sup> February 1820 Hofrat Prof. Dr. phil. Dr. med. Ritter Johann Christian Rosenmüller died aged 48 in Leipzig due to Angina pectoris. It had already troubled him more and more for several years by asthmatic fits (HIRSCH 1889).

Due to his engagement as a physician Johann Christian Rosenmüller is less known as the „father of the cave bear“, than for his anatomical discoveries in the history of science. Every physician probably heard in his studies about Rosenmueller's gland, Rosenmueller's organ or Rosenmueller's fossa, anatomical features Rosenmueller first described (PSCHYREMBEL 1994, 1345).

The scientific biography of Rosenmüller clearly illustrates that the holotype of the species *Ursus spelaeus* was the object of his first dissertation for a philosophical doctorate. Because dissertations are the intellectual properties of individual researchers (now and then), only Rosenmüller's name can rightfully be attached to the species *U. spelaeus* if following the rules of binominal classification. Neither ROSENMÜLLER & HEINROTH 1794, nor any other names, like Blumenbach or Cuvier, are historically correct and should not be used any further.

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