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### The late Jurassic decapod species *Aeger tipularius* (SCHLOTHEIM, 1822) (Crustacea: Decapoda: Aegeridae)

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With 5 figures

#### Abstract

The holotype of *Aeger tipularius* (SCHLOTHEIM, 1822), type species of the decapod genus *Aeger* MÜNSTER, 1839, is revised for the first time. It turned out that most of the specimens figured in literature under this well-known specific name belong to the co-occurring and much more common *Aeger spinipes* (DESMAREST, 1822).

#### Zusammenfassung

Der Holotypus von *Aeger tipularius* (SCHLOTHEIM, 1822), Typusart der Krebs-Gattung *Aeger* MÜNSTER, 1839, wird erstmals nachuntersucht. Es stellte sich heraus, daß die meisten Stücke, die in der Literatur unter diesem bekannten Namen abgebildet wurden, nicht hierzu gehören, sondern zu der gleichzeitig vorkommenden, aber wesentlich häufigeren Art *Aeger spinipes* (DESMAREST, 1822).

#### 1. Introduction

During investigations and comparisons of Upper Jurassic decapods from southern Germany, mainly from the famous late Kimmeridgian fossil site of Nusplingen in Swabia (see DIETL & SCHWEIGERT 1999), the taxonomic status of several species and genera was felt to be confusing. With the exception of the prosopids (WEHNER 1988; MÜLLER et al. 2000) no other modern revisions of the large number of species and genera described mainly by SCHLOTHEIM (1820, 1822), MÜNSTER (1839), and OPPEL (1862) exist besides the works of FÖRSTER (1966, 1967, 1973, 1977).

The latest attempts, thus starting a new investigation campaign, were recently undertaken by POLZ (1999, 2000), SCHWEIGERT (2001a, 2001b), and SCHWEIGERT & DIETL (1999).

When trying to determine the only complete specimen belonging to the genus *Aeger* from Nusplingen (fig. 1), a strong difference between the original description

and figure of *Aeger tipularius* (SCHLOTHEIM) and later ones became obvious and rendered a re-investigation of the holotype inevitable. The holotype from SCHLOTHEIM's collection is stored at the Berlin museum (MNHB). Hitherto, it has been never figured photographically.

#### Abbreviations:

- GPIT Institut und Museum für Geologie und Paläontologie der Universität Tübingen, Germany  
 BSPM Bayerische Staatssammlung für Paläontologie und Geologie, Munich, Germany  
 MNHB Museum für Naturkunde der Humboldt-Universität Berlin, Germany  
 SMNS Staatliches Museum für Naturkunde Stuttgart, Germany

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## 2. Systematic Part

Order Decapoda LATREILLE, 1803  
 Unterordnung Dendrobranchiata BATE, 1888  
 Superfamily Penaeoidea RAFINESQUE, 1815  
 Family Aegeridae BURKENROAD, 1963

Genus *Aeger* MÜNSTER, 1839

Type species: *Macrourites tipularius* SCHLOTHEIM, subsequent designation by WOODS (1925: 5).

*Aeger tipularius* (SCHLOTHEIM, 1822)

Fig. 1–4

- v \*1822 *Macrourites tipularius*. – SCHLOTHEIM, p. 32, pl. 2, fig. 1 (holotype).  
 v non 1839 *Aeger tipularius*. – MÜNSTER, p. 66, pl. 25, figs. 1–2.  
 v 1855 *Palaemon spinipes*. – FRAAS, p. 92. – [Nusplingen]  
 v 1857 *Macrurites tipularius* (*Palaemon spinipes* DESM.). – QUENSTEDT, p. 805. – [Nusplingen]  
 v non 1862 *Aeger tipularius* SCHLOTH. – OPPEL, p. 110, pl. 34, figs. 1–2.  
 v 1862 *Aeger Bronni* OPP. – OPPEL, p. 111, pl. 35, fig. 1.  
 v 1862 *Aeger armatus* OPP. – OPPEL, p. 111, pl. 36, figs. 1–3.  
 non 1866 *Aeger tipularius*. – QUENSTEDT, p. 326, pl. 26, figs. 23–24.  
 1866 *Aeger armatus* OPPEL. – QUENSTEDT, p. 326.  
 non 1883 *Aeger tipularius*. – QUENSTEDT, p. 417, pl. 32, figs. 29–30.  
 1883 *Aeger armatus* OPPEL. – QUENSTEDT, p. 417.  
 non 1900 *Aeger tipularius* SCHLOTH. sp. – ZITTEL, fig. 1385.  
 non 1904 *Aeger tipularius* SCHLOTH. – WALTHER, p. 173.  
 v 1904 *Aeger armatus* OPP. – WALTHER, p. 173.  
 v 1904 *Aeger Bronni* OPP. – WALTHER, p. 173.  
 v 1908 *Aeger tipularis* SCHL. sp.- ENGEL, p. 471. – [Nusplingen]  
 non 1920 *Aeger tipularius* SCHLOTH. – ABEL, fig. 145.  
 non 1922 *Aeger tipularius* SCHLOTH. – ABEL, fig. 431

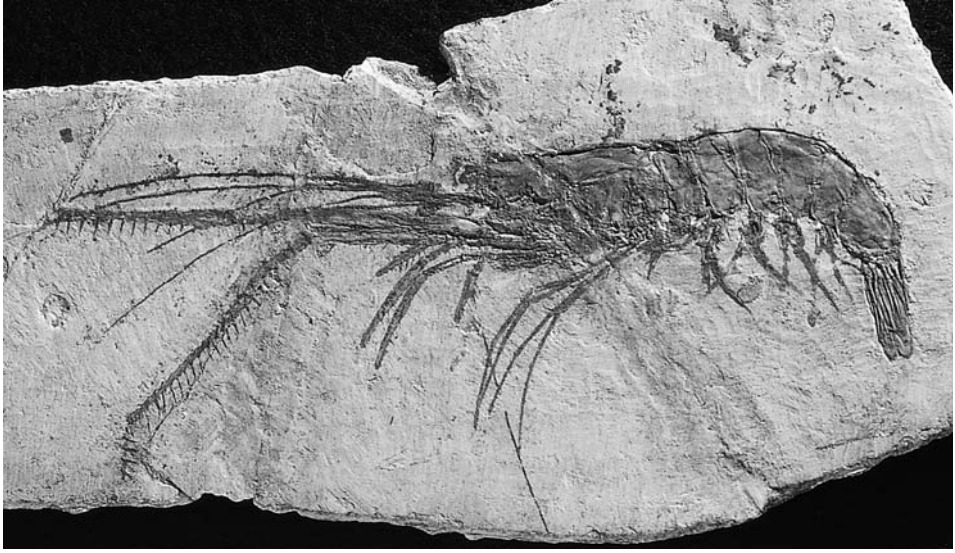


Fig. 1. *Aeger tipularius* (SCHLOTHEIM). Nusplingen Lithographic Limestone, Nusplingen quarry; Upper Kimmeridgian, Beckeri Zone, Ulmense Subzone – oldest stratigraphical record of this species. SMNS no. 64529 (coll. O. FRAAS). – Width of figure 19 cm.

- non 1923 *Aeger tipularius* (SCHLOTHEIM). – BALSS, p. 128, figs. 1, 3.  
 1929 *Aeger armatus* OPPEL, 1862. – GLAESSNER, p. 51.  
 1929 *Aeger Bronni* OPPEL, 1862. – GLAESSNER, p. 52.  
 pars 1929 *Aeger tipularius* (SCHLOTHEIM), 1812. – GLAESSNER, p. 53.  
 non 1953 *Aeger tipularius* (SCHLOTH.). – ROGER, pl. 5, fig. 3a.  
 1961 *Aeger armatus* OPPEL 1862. – KUHN, p. 22.  
 1961 *Aeger bronni* OPPEL 1862. – KUHN, p. 22.  
 non 1961 *Aeger tipularius* (SCHLOTH.) 1812. – KUHN, p. 22.  
 non 1963 *Aeger tipularius* (SCHLOTH.). – KUHN, fig. 33.  
 non 1963 *Aeger tipularius* v. SCHLOTH. – MÜLLER, fig. 143.  
 non 1965 *Aeger tipularius* (SCHLOTH.). – GLAESSNER, fig. 4.  
 non 1966 *Aeger tipularius* (SCHLOTH.). – KUHN, fig. 45.  
 v non 1967 *Aeger tipularius* (SCHLOTHEIM). – FÖRSTER, pp. 164–166, figs. 2, 3a.  
 v non 1968 *Aeger tipularius*. – LEICH, p. 84, fig. on p. 85.  
 non 1969 *Aeger tipularius* (SCHLOTHEIM). – GLAESSNER, p. R447, fig. 252.3.  
 non 1976 *Aeger tipularius* (SCHLOTHEIM 1822). – MALZ, p. 49, fig. 31.  
 v 1976 *Aeger tipularius* (SCHLOTHEIM). – MUNDLOS, fig. on p. 163. – [Nusplingen]  
 v non 1978 *Aeger tipularius*. – BARTHEL, p. 318, pl. 39, fig. 1.  
 non 1978 *Aeger tipularius* v. SCHLOTH. – MÜLLER, p. 132, fig. 142A.  
 non 1981 *Aeger tipularius* (SCHLOTHEIM). – RICHTER, p. 275, fig. D1.  
 1981 *Aeger armatus* OPPEL. – RICHTER, p. 275, fig. D3.  
 non 1990 *Aeger tipularius*. – PINNA, p. 106, fig. 6.  
 non 1990 *Aeger tipularius* SCHLOTHEIM. – BARTHEL et al., fig. 7.24.  
 v 1987 *Aeger tipularius* (SCHLOTHEIM). – ZIEGLER, colour-fig. 5. – [Nusplingen]  
 non 1994 *Aeger tipularius* (SCHLOTHEIM) 1812. – FRICKHINGER, p. 106, figs. 173–174  
 1994 *Aeger armatus* OPPEL 1862. – FRICKHINGER, p. 106, fig. 171.  
 non 1999 *Aeger tipularius* (v. SCHLOTHEIM, 1822). – FRICKHINGER, p. 40, fig. 60.  
 v 2000 *Aeger* aff. *tipularius* (SCHLOTHEIM). – SCHWEIGERT et al., p. 3. – [Nusplingen]  
 non 2000 *Aeger tipularius* (SCHLOTHEIM 1822). – VIOHL, pl. 57.  
 non 2000 *Aeger tipularius* (SCHLOTHEIM). – RÖPER et al., p. 102, figs. 78, 156.

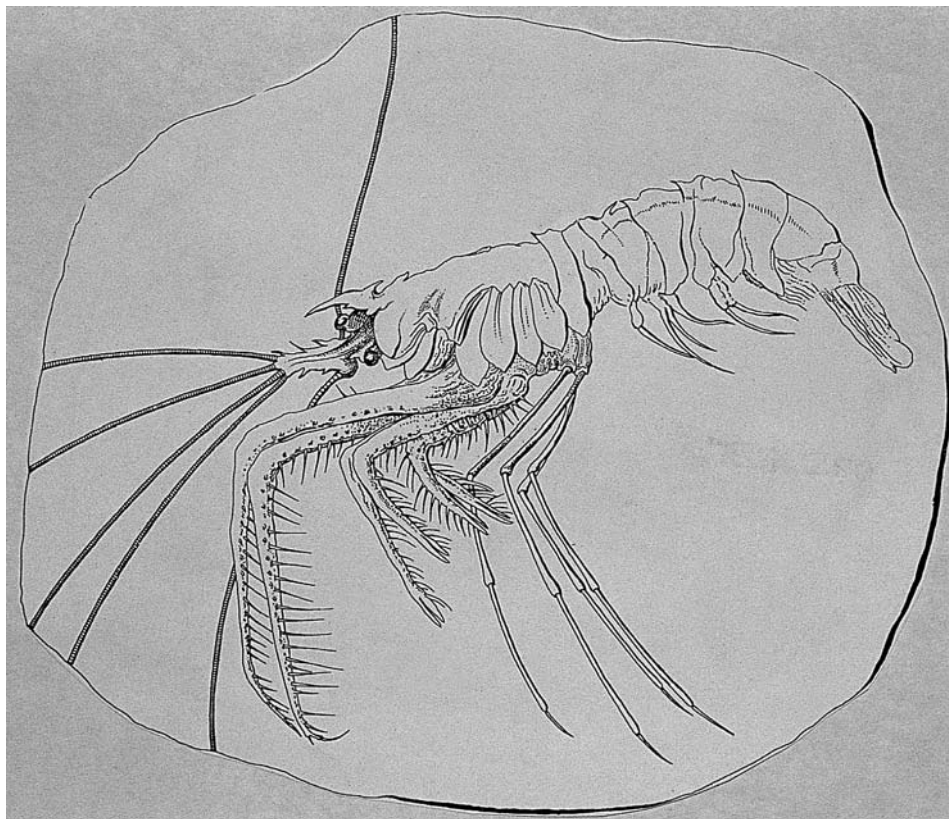


Fig. 2. *Aeger tipularius* (SCHLOTHEIM), holotype, original figure of SCHLOTHEIM (1822, pl. 2, fig. 1), see also Fig. 3. Solnhofen Lithographic Limestone, Solnhofen area; Lower Tithonian, Hybonotum Zone. – Width of figure 23.7 cm

Holotype: Specimen figured by SCHLOTHEIM (1822, pl. 2, fig. 1), re-figured herein (figs. 2, 3). In his original description, SCHLOTHEIM compared his figured specimen, the only one of his collection, with other specimens earlier figured by KNORR (1755, pl. 13b, 13c), which he said to be much poorer preserved. In descriptions of new species, SCHLOTHEIM (1820, 1822) gave generally synonym lists of his specimens, but in the present case of KNORR's specimens he only notified a "confer"-determination. Consequently, the specimens of KNORR should not be included in the type series. Thus, the type series of *Macrourites tipularius* SCHLOTHEIM consists only of the holotype by monotypy. Moreover, the first reviser of late Jurassic decapods, MÜNSTER (1839), did not include either the specimens figured in KNORR into the species *Aeger tipularius* (see below).

Type locality and stratum: Solnhofen Lithographic Limestone of "Solnhofen". The exact finding locality and finding level are unknown. According to my observation, the lithology of the rock containing the holotype is not typical of any present quarry district in the Solnhofen or Eichstätt area. Most probably it comes from an abandoned quarry in the surroundings of Solnhofen – not of Eichstätt. New material shows that in Franconia *Aeger tipularius* (SCHLOTHEIM) is found mainly in the Solnhofen area, whereas *Aeger tipularius* sensu OPPEL (= *Aeger spinipes* (DESMAREST), see below) is more common in the Eichstätt area. Probably, this is caused by palaeoecological reasons. However, rare specimens of *Aeger tipularius* (SCHLOTHEIM) are also recorded from Schernfeld (Eichstätt area) and Zandt.

Occurrence: Upper Jurassic of southern Germany: Solnhofen area and Nusplingen (La-

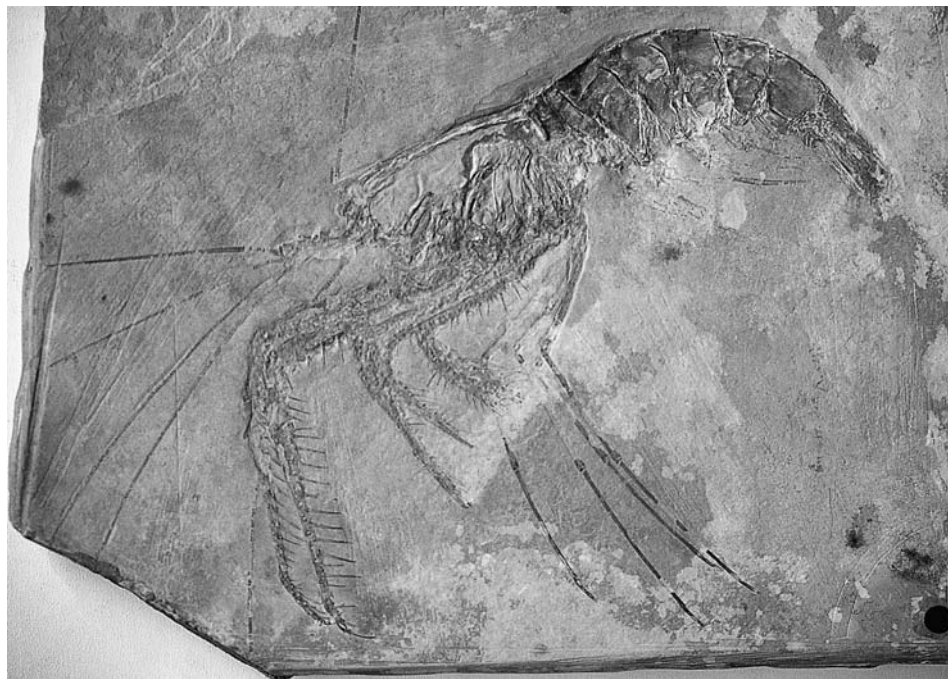


Fig. 3. *Aeger tipularius* (SCHLOTHEIM), holotype. Solnhofen Lithographic Limestone, Solnhofen area; Lower Tithonian, Hybonotum Zone; MNHB, no. MB.A. 250 (coll. SCHLOTHEIM). – Width of figure 18.5 cm.

te Kimmeridgian, Beckeri Zone, Ulmense Subzone – Early Tithonian, Hybonotum Zone, Rueppellianum Subzone).

**Diagnosis.** – Very short, smooth rostrum; 3<sup>rd</sup> maxilliped extremely long with movable spines, 1<sup>st</sup>, 2<sup>nd</sup>, and 3<sup>rd</sup> pereopod chelate, the 1<sup>st</sup> and 2<sup>nd</sup> one bearing long movable spines, the 3<sup>rd</sup> pereopod with spinose chelae; 4<sup>th</sup> and 5<sup>th</sup> pereopods achelate and lacking spines; 3<sup>rd</sup> pereopod slightly larger than 1<sup>st</sup> and 2<sup>nd</sup> pereopod; well-developed pleopods; surface of carapace finely granulate; uropods with diaeresis.

**Description and remarks.** – The holotype of *Aeger tipularius* (SCHLOTHEIM) is a well preserved but only moderately prepared specimen (exuvia), which is almost complete and shows all diagnostic features including the pereopods 1–5 and the 3<sup>rd</sup> maxilliped. SCHLOTHEIM (1822) erroneously interpreted the 3<sup>rd</sup> maxilliped as a pereopod, so that his figure only shows 5 pairs of appendages besides the antennae and antennules. In reality, the 3<sup>rd</sup> pereopod of the holotype is hidden in part by the 2<sup>nd</sup> one. The rostrum is originally short and not broken away. The antennae and antennules are not completely preserved due to the format of the piece of rock.

The closest reconstruction of *Aeger tipularius* (SCHLOTHEIM) is shown in the figure given by OPPEL (1862, pl. 35, fig. 1) for his “*Aeger bronni*” (fig. 4). The main differences between the true *Aeger tipularius* (SCHLOTHEIM) and *Aeger tipularius* sensu OPPEL (= *Aeger spinipes* (DESMAREST), see below) are the very short rostrum and the spinose chelae of the 3<sup>rd</sup> pereopod in *A. tipularius* (SCHLOTHEIM). The type

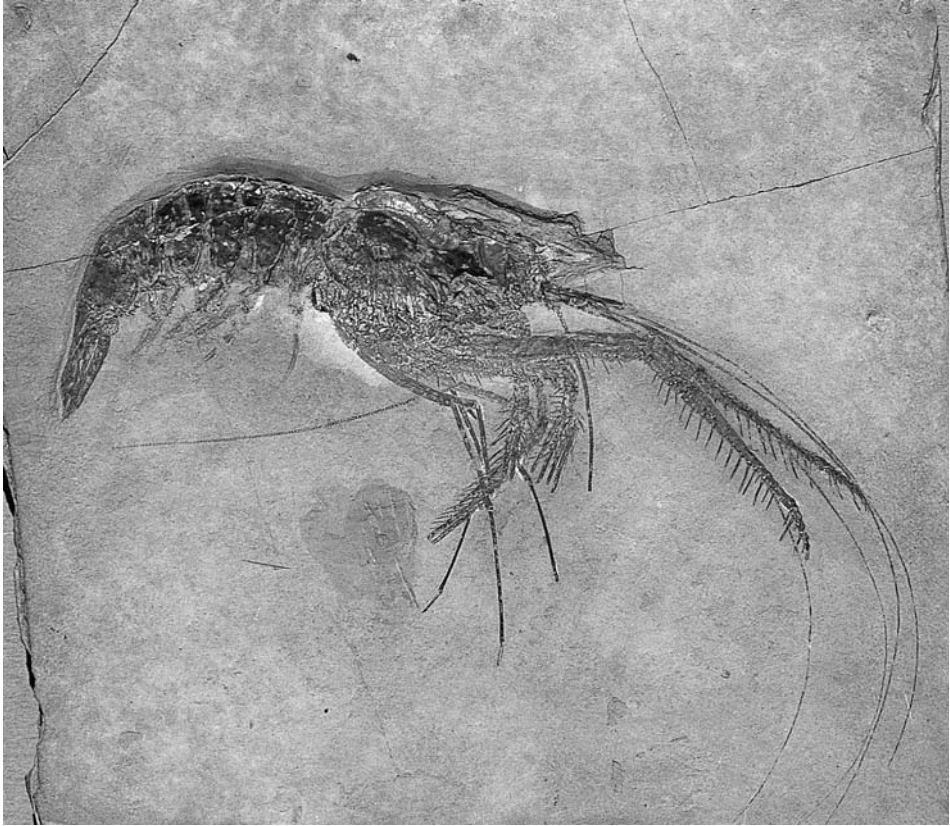


Fig. 4. *Aeger tipularius* (SCHLOTHEIM) (= holotype of *Aeger bronni* OPPEL). Solnhofen Lithographic Limestone, Solnhofen; Lower Tithonian, Hybonotum Zone; BSPM no. AS I 959. – Width of figure 19.3 cm.

series of the species *Aeger armatus* OPPEL consists of exuviae of young individuals of *Aeger tipularius* (SCHLOTHEIM).

### 3. How to treat *Aeger tipularius* sensu OPPEL

Mainly the revision of Jurassic decapods presented by OPPEL (1862) has caused a considerable confusion in several species of the genus *Aeger* MÜNSTER, which is obvious in the list of synonyms given above. In contrast to MÜNSTER (1839), OPPEL (1862) and especially FÖRSTER (1967) recognized the dorsal spine (rostrum) to be the best diagnostic character to differentiate the species. This view is generally accepted, not only for late Jurassic representatives of the genus (see GARASSINO & TERUZZI 1990). FÖRSTER even assumed a sexual dimorphism between a form with an extremely long rostrum which he – erroneously – determined as *Aeger tipularius* (SCHLOTHEIM) and another one, *A. elegans* MÜNSTER, with a moderately long, but distinctly differing rostrum. It is not the aim of this short note to deal with this idea of sexual dimorphism which could only be proved by excellently preserved material,

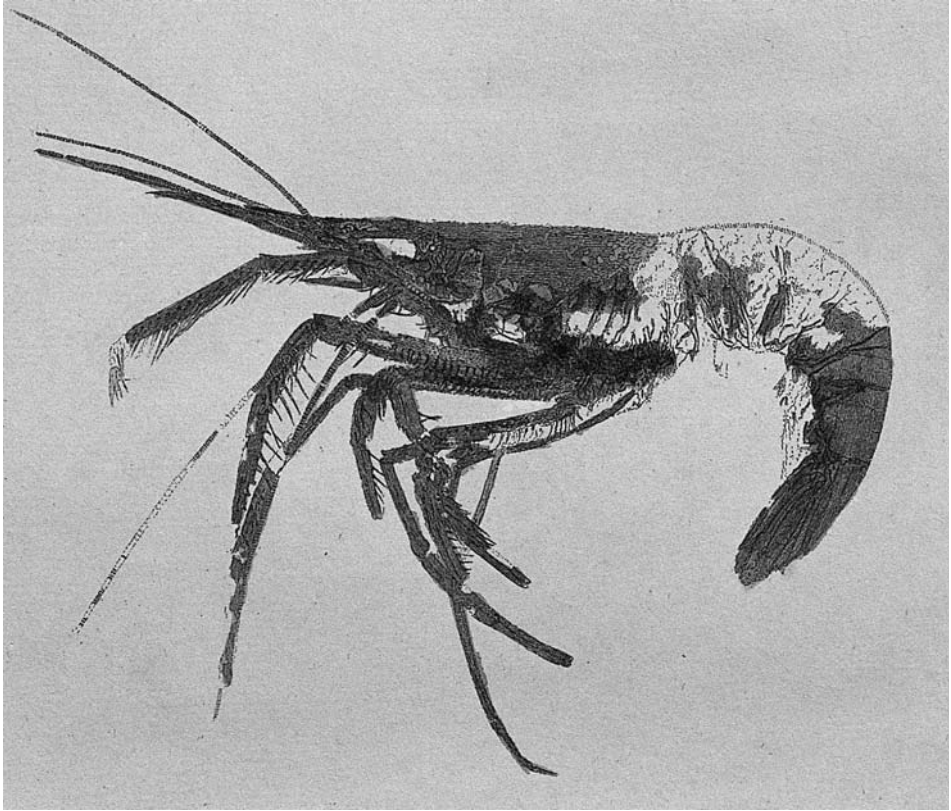


Fig. 5. *Aeger spinipes* (DESMAREST), holotype (from KNORR 1755, pl. 13b, fig. 1), original specimen of unknown depository, probably lost. Note the long rostrum and the non-spinose chelae of the 3<sup>rd</sup> pereopod! Solnhofen Lithographic Limestone, probably from the Eichstätt district, Early Tithonian, Hybonotum Zone. – Width of figure 14.5 cm.

statistical methods and a careful analysis of the finding levels and localities where the material comes from.

The above given investigation of the holotype of *Aeger tipularius* shows, that *Aeger bronni* OPPEL and *Aeger armatus* OPPEL are both junior synonyms of the true *Aeger tipularius* (SCHLOTHEIM). The more common form with an extremely long rostrum, and the 3<sup>rd</sup> pereopod lacking spines which since OPPEL has been thought to represent the typical “*tipularius*”, however, does in fact not belong to this species. The oldest available name for OPPEL’s “*tipularius*” form is *Aeger spinipes* (DESMAREST). Like *Aeger tipularius*, *Aeger spinipes* was published in 1822. DESMAREST (1822) based his species “*Palaemon*” *spinipes* on a specimen figured by KNORR (1755, pl. 13b, fig. 1), which is hence the holotype, and he re-figured the original drawing given by KNORR. Since the fundamental revision of OPPEL (1862), *Aeger spinipes* (DESMAREST) was erroneously regarded as a synonym of *A. tipularius* (SCHLOTHEIM). Now the revision of SCHLOTHEIM’s type specimen reveals that *Aeger spinipes* represents an independent valid taxon.

The holotype of *Aeger spinipes* (DESMAREST) is missing and seems to be lost. Only few specimens from the beautiful monograph of KNORR have been identified in the collections (CLEEVLEY 1983). Since the figures of the old literature are not easily available, the original figure of *Aeger spinipes* is reproduced herein (fig. 5). The most detailed reconstruction and description of this species was given by BALSS (1923, fig. 3, "*Aeger tipularius*"). In respect of articles 75.2–75.3 of the ICZN it is not necessary to designate a neotype for *Aeger spinipes* (DESMAREST).

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