

Resurrection and neotype designation of *Pilumnus spinulosus* Kessler, 1861 (Crustacea: Decapoda)

Восстановление и обозначение неотида *Pilumnus spinulosus* Kessler, 1861 (Crustacea: Decapoda)

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КЛЮЧЕВЫЕ СЛОВА: таксономия, номенклатура, Brachyura, Pilumnidae, *Pilumnus*, Черное море.

ABSTRACT. The scientific name *Pilumnus spinulosus* Kessler, 1861 is resurrected for the representatives of the brachyuran genus *Pilumnus* Leach, 1816 (Decapoda: Brachyura: Pilumnidae), occurring along the northern coastal line of the Black Sea. This species has been mistakenly identified as *P. hirtellus* (Linnaeus, 1761) and recently, based on DNA data, referred to as *P. aestuarii* Nardo, 1869. Furthermore, a neotype of *P. spinulosus* Kessler, 1861 is designated as the original material is presently considered as lost. *P. hirtellus ponticus* Czerniavsky, 1868, *P. aestuarii* Nardo, 1869, *P. hirtellus intermedia* Czerniavsky, 1884 are considered as junior synonyms of *P. spinulosus* Kessler, 1861.

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РЕЗЮМЕ. Научное название *Pilumnus spinulosus* Kessler, 1861 восстановлено для представителей рода *Pilumnus* Leach, 1816 (Decapoda: Brachyura: Pilumnidae), встречающегося вдоль северной береговой линии Черного моря. Ранее этот вид был ошибочно идентифицирован как *P. hirtellus* (Linnaeus, 1761), а позднее, на основании данных ДНК, отнесён к *P. aestuarii* Nardo, 1869. Видовые названия *P. hirtellus ponticus* Czerniavsky, 1868, *P. aestuarii* Nardo, 1869, *P. hirtellus intermedia* Czerniavsky, 1884 рассматриваются как младшие синонимы *P. spinulosus* Kessler, 1861.

The Decapoda from the Black Sea include a number of taxa, that were identified with species from other European seas in early years of faunistic research, while

some older local studies were overlooked. Representatives of the brachyuran genus *Pilumnus* Leach, 1816 (Decapoda: Pilumnidae), occurring along the Russian coasts of the Black Sea, were re-named several times with several subspecies described [Markuzen, 1868; Czerniavsky, 1868, 1884; Băcescu, 1967; Kobjakova, Dolgopolskaya, 1969; Spiridonov, Petryashov, 2011; Anosov *et al.*, 2012; Anosov, Ignatyev, 2016; Marin, 2018]. Recently published data, based on both morphological and DNA analysis (see Marin [2018]), revealed the presence of only one species along the northern coastline of the Black Sea, namely *Pilumnus aestuarii* Nardo, 1869 (see Marin [2018]). At the same time, these data allowed to resurrect the older name, *P. spinulosus*, proposed by Kessler [1861] for the representatives of the genus from this part of the Black Sea.

Karl Fedorovich (Karl-Friedrich) Kessler (1815–1881), a famous zoologist and ichthyologist professor, one of the founders of the Sevastopol Biological Station (Crimean Peninsula), worked at the St. Vladimir University in Kiev (now Ukraine) in 1842–1861, where he conducted research on the aquatic fauna of the Black Sea region, mainly the northern shores of the Black and Azov seas, the Crimean Peninsula, the Dnieper, as well as the Neva and Volga river basins and the Ladoga and Onega Lakes (e.g., Bogdanov [1882]). In 1861, he published the monograph “Journey with a zoological purpose to the northern shore of the Black Sea and the Crimea in 1858”, with the description of two new decapod species, namely *Pilumnus spinulosus* Kessler, 1861 and *Pagurus ponticus* Kessler, 1860. Since then, *Pilumnus spinulosus* has been synonymized with *Pilumnus hirtellus* (Linnaeus, 1761) (e.g., Pesta [1918]; Schubart [2014]; Anosov & Ignatyev [2016]; Marin [2018]), while *Pagurus ponticus* is currently regarded as a jun-

ior synonym of *Diogenes pugilator* (Roux, 1829) (e.g., McLaughlin *et al.* [2010]).

The original description of *P. spinulosus* was presented by Kessler [1861], based on samples collected during his trip in 1858 (see above) without exact location, except for the indication “the northern shore of the Black Sea”. Kessler [1861] described the species as: “thoracic “potsherd” (=carapace) rather smooth, covered with thick hairs near edges; its anterior-lateral edges are armed with 4 forward-facing spikes (not counting the fifth, occupying the outer corner of the orbit), which are often two- or three-pronged. Distal front serrated, with 14 small spinules; it is divided into two parts with median notch. The edges of the orbits are serrated, with spinules on the lower border of the orbits larger than on the upper border; besides, there is a small notch in each orbit. Both claws, of which the right one is much larger than the left, are completely smooth. The color of “potsherd” (=carapace) is reddish brown, with whitish spots; the claws are brown with dark brown fingers. The length of the thoracic “potsherd” (=carapace) in the largest of our specimens is 17 mm, the width is 24 millimeters. It differs from the variety *Pilumnus villosus*, mentioned by Risso (1827) (presently the junior synonym of *Pilumnus villosissimus* (Rafinesque, 1814)), by the considerable width of the thoracic “potsherd” (=carapace).”

This precise description is in general accordance with the descriptions of *Pilumnus aestuarii* Nardo, 1869 presented by Nardo [1869] and Marin [2018]. Individuals of the genus *Pilumnus*, occurring along the northern coasts of the Black Sea, have deeply red or reddish-brown carapaces with light spots, reddish-brown chelipeds and walking legs, finger tips of chelipeds brown in mature or yellow in young specimens (see Marin, 2018: Fig. 2b–d). Moreover, *Pilumnus spinulosus* can be readily morphologically separated by its glabrous carapace and the lack of spinulation on the palm of chelipeds, especially on larger chela. Schubart [2014] also suggested to use the urocardiac and mesocardiac gastric ossicle for the species identification that were also described in by Marin [2018] clearly separating the species from the congeners and misidentified *P. hirtellus*. According to the size of the specimens mentioned by him, Kessler [1861] collected rather small specimens, characteristic for sheltered (rocky) habitats, similar to those described from the Kazachiya Bay at the Crimean Peninsula (see Marin [2013, 2018]). Specimens from less protected sandy substrates, such as those described from Taman Bay (see Marin [2018]), are significantly larger, reaching carapace width (cw.) up to 35 mm in males, and cw. 28 mm in females. Since Monod [1956: 249] and Oliveira-Biener *et al.* [2010: 191] treated *Pilumnus spinulosus* as potentially valid, we think that Art. 23.9.1.1. of ICZN [1999] on the reversal of precedence (“the senior synonym or homonym has not been used as a valid name after 1899”) does not apply and that the name introduced by Kessler cannot be treated as a *nomen oblitum*. The other *Pi-*

lumnus species (subspecies), described from the Black Sea coast, namely *Pilumnus hirtellus* var. *ponticus* Czerniavsky, 1868 (= *P. ponticus* Czerniavsky, 1868) and *P. hirtellus intermedia* Czerniavsky, 1884 (= *P. intermedia* Czerniavsky, 1884) (see Czerniavsky [1868, 1884]; Spiridonov, Petryashov [2011]; Anosov *et al.* [2012]; Anosov, Ignatyev [2016]), should be also referred as junior synonyms of *P. spinulosus* Kessler, 1861 and not of *P. hirtellus* (Linnaeus, 1761).

Nardo [1869] did not mention any type specimen of *Pilumnus aestuarii* in the original description of the species. However, a box with a selected large male specimen, indicated as *P. aestuarii* (Fig. 1f), from the Istituto Veneto Scienze lettere ed Arti, the Research Institute, Venice, Italy, where Nardo worked for a long time, is stored in the scientific collection of Museo di Storia Naturale di Venezia, Venice, Italy (MSNV). We suppose that this specimen was used by Nardo [1869] for the original species description.

Results of phylogenetic reconstruction based on barcoding (COI mtDNA gene marker) using Maximum–Likelihood algorithm (see Marin [2018]) indicated close relation of the *Pilumnus spinulosus* from the northern coasts of the Black Sea to Mediterranean–Black Sea clade of *P. aestuarii* (after Oliveira-Biener *et al.* [2010]; Schubart [2014]), originally described from the shallow and brackish lagoon of Venice in the Adriatic Sea [Nardo, 1869]. Additional similarities in morphology (see Marin [2018]) allow us to consider the latter species as a junior synonym.

Family Pilumnidae Samouelle, 1819
Genus *Pilumnus* Leach, 1816

Pilumnus spinulosus Kessler, 1861
Fig. 1.

Pilumnus hirtellus ponticus Czerniavsky, 1868

Pilumnus aestuarii Nardo, 1869

Pilumnus hirtellus intermedia Czerniavsky, 1884

NEOTYPE. Male (cw. 35 mm), ZMMU Ma 6015 – northern Black Sea, Azov, Russian Federation, Krasnodar region, Taman Bay, 45°14'52.9"N 36°51'16.0"E, rocks with clusters of *Mytilus* cf. *galloprovincialis* and other sessile animals (sponges, ascidians and etc.), depth 1.5–2 m, coll. I. Marin, 16 Aug. 2017. The specimen (Fig. 1a) is deposited in the collection of Zoological Museum of Moscow State University, Moscow (ZMMU).

DIAGNOSIS (after Marin [2018]). Carapace quadrilateral, glabrous, covered with sparse thick, brush-like plumose setae; regions indistinct, frontal margin divided by deep medial groove into two prominent lobes, frontal and supraorbital margins with a marked rim; anterolateral margin of carapace with five sharp, anteriorly directed teeth, with the posterior teeth being larger; orbital margins dorsally denticulated; sternal surface smooth. Chelipeds unequal, with smooth and glabrous segments; carpus unarmed; propodus (palm) smooth and glabrous, without distinct teeth; surface of fingers glabrous and smooth, cutting margins armed with large blunt rounded teeth, the proximal teeth being larger, especially on major cheliped. Ambulatory legs long, densely covered with stiff plumose setae in small specimens and less pubescent in large specimens; merus and



Fig. 1. *Pilumnus spinulosus* Kessler, 1861, neotype male (*a–d*) (ZMMU Ma 6015) and male (*e*) from Taman Bay of the Black Sea: *a* — general view; *b*, *e* — carapace; *c* — palm of larger chela; *d* — palm of smaller chela; *f* — probable type specimen of *Pilumnus aestuarii* Nardo 1869 (MSNV), Dalmazia, East coasts of the Gulf of Venice. Scale — 10 mm.

Рис. 1. *Pilumnus spinulosus* Kessler, 1861, неогип, самец (*a–d*) (ZMMU Ma 6015) и самец (*e*) из Таманского залива Черного моря: *a* — общий вид; *b*, *e* — карапакс; *c* — большая клешня; *d* — меньшая клешня; *f* — вероятный типовой экземпляр *Pilumnus aestuarii* Nardo 1869 (MSNV), Далмация, восточное побережья Венецианской бухты. Масштаб 10 мм.

carpus unarmed, without spines or granules. Abdomen consisting of five articulating segments, distal segment triangular, with rounded distal margin, slightly shorter than penultimate segment. Gastric urocardiac ossicle with blunt cubic dorso-median tooth possessing rounded corners, mesocardiac ossicles well-marked. Gonopod I sinuous, tip distinctly bent downwards, subterminal portion with numerous long thin simple setae; gonopod II short, with terminal flagellum.

GenBank accession numbers. MN520186–MN520189 (sequences from the topotypic material; see also Marin [2018]).

DISTRIBUTION. Presently, *P. spinulosus* is recorded along the northern coastline of the Black Sea from the Crimean Peninsula to the Caucasian shores and Venice lagoon as the type locality of *P. aestuarii*. It is probably a widely distributed species, mainly in brackish waters of the Black Sea as well as in the Mediterranean basin in brackish water habitats [Oliveira-Biener *et al.*, 2010; Schubart *et al.*, 2012; Schubart, 2014].

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