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The *Postilla* series, which ceased publication with Number 232 (2004), was incorporated into the journal *Bulletin of the Peabody Museum of Natural History*, available from BioOne Complete at https://bioone.org/.

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Postilla Number 205
10 July 1989

Pariphinotus Kunkel, 1910, the Senior Synonym of *Heterophlias* Shoemaker, 1933 (Crustacea: Amphipoda: Phliantidae)

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(Received 27 September 1988)

Abstract

The synonymy of the genera *Pariphinotus* and *Heterophlias* has been debated many times in the literature. Historically a distinction has been maintained between these two phliantid genera because of morphological differences reported in the literature by the original descriptors and subsequent workers. Our examination of specimens of both genera demonstrates *Pariphinotus* and *Heterophlias* to be synonymous. *Heterophlias* has been regarded as the valid genus by most authors; *Pariphinotus,* however, is shown to be the senior synonym of *Heterophlias.*

Key Words

Amphipoda, Pariphinotus, Heterophlias, synonymy, Phliantidae.

Contribution No. 1200 from the Bermuda Biological Station for Research.

ISBN No. 0-912532-18-3

Introduction

The dinosaurian-like phliantid amphipods are rarely collected (Barnard 1979); two sporadically reported and morphologically similar genera, *Pariphinotus* and *Heterophlias,* have caused considerable debate over the last three decades. Kunkel (1910) erected the genus *Pariphinotus* from Bermuda, and Shoemaker (1933) established the genus *Heterophlias* from Dry Tortugas, Florida. For decades the literature contained no mention of these monotypic genera other than their inclusion in Barnard's 1958 Index. Not until the next decade, primarily when Barnard (1962) described a new subspecies of *H. seclusus* and when he first suggested that *Pariphinotus* and *Heterophlias* might be synonymous (Barnard 1969a), did these genera again receive scientific attention. Mills (1964) examined Kunkel's two type specimens, but because both were desiccated and the male, damaged, he concluded only that Kunkel's (1910) description for *Pariphinotus* must stand.

Since the late sixties, two new species of *Heterophlias* have been described (Ortiz 1976, Barnard 1979). Range extensions for *H. seclusus* (Wakabara and Pereira Leite 1977; Nelson 1978, 1979) and *H. seclusus escabrosa* (Barnard 1969b, c) have also been given. The known distribution for the phliantids under consideration in this paper now includes semitropical and tropical marine waters of the western Atlantic and eastern Pacific. In the

Atlantic, species extend from North Carolina (Nelson 1978, 1979) and Bermuda (Kunkel 1910 and recent collections) to approximately 20° S off the coast of Brazil (Wakabara and Pereira Leite 1977). In the Pacific, species can be found from Cayucos, California, to the Galápagos Islands (Barnard 1979).

In addition to the description of new species and the extension of species' ranges, debate on the synonymy of *Pariphinotus* and *Heterophlias* has continued (Barnard 1972, 1979, 1981; Wakabara and Pereira Leite 1977; Ledoyer 1982). This debate has remained speculative because specimens of *Pariphinotus* from Bermuda were unavailable or assumed to be so. However, recent collections of *Pariphinotus* in Bermuda and a re-examination of the female paralectotype of *P. tuckeri,* deposited in the Peabody Museum of Natural History, Yale University (YPM), have allowed us to clarify definitively the questions, problems and ambiguities presented in and raised by the literature regarding the status of *Pariphinotus* and *Heterophlias.*

Morphology and Systematics

The focus of the debate on the possible synonymy of *Pariphinotus* and *Heterophlias* has centered on three morphological features: the third uropod, the mandibular molar, and the inner lobes of the lower lip.

Kunkel (1910) described *P. tuckeri* as lacking a third uropod; Shoemaker (1933) described *H. seclusus* as possessing a third uropod consisting of a single thick joint (=peduncle, no rami). This difference has been the main diagnostic feature separating the two genera (Barnard 1969a; Wakabara and Pereira Leite 1977). Wakabara and Pereira Leite (1977) pointed out that the third uropod of *Heterophlias* is difficult to discern because it lies hidden dorsally by the large telson. They believed that Kunkel (1910) might have overlooked it. For the same reason, Barnard (personal communication) urged our examination of Bermuda material to determine the presence or absence of the third uropod. Despite Mills' (1964) dismissal of the *Pariphinotus* type specimens, our re-examination of the desiccated female, a relative giant at 5.5 mm, revealed that Kunkel did indeed overlook uropod 3. Also, recently collected specimens from Bermuda [collections of the YPM and the United States National Museum (USNM)] all possess a third uropod, without rami, and therefore *Pariphinotus* and *Heterophlias* are indistinguishable genera in this important respect.

One recently collected Bermuda specimen possesses third uropods that uncharacteristically extend beyond the telson (Fig. 1). The specimen is medium-sized and the condition therefore is not allometric. Wakabara and Pereira Leite's (1977) figure of a female *Heterophlias* exhibits a similar variation of the telson/uropod three complex.

The mandibular molar is lacking in *Pariphinotus* according to Kunkel's (1910) description (no figure provided); in *Heterophlias,* the mandibular molar is present as a conical projection terminating in a large spine. Although for *Heterophlias* the mandibular molar is variably described in prose, in figures it always appears similar with one minor exception, the figure of Wakabara and Pereira Leite (1977) in which there is no distinction between projection and spine. In 1979 Barnard believed that a generic distinction should be maintained because of the presence or absence of a molar. Kunkel (1910) indeed stated that there is no molar in *Pariphinotus,* but careful reading of his description suggests he actually did see one, for he went on in the same sentence to describe a "spine row with a single spine," a phrase which we interpret as a case of mistaken identity, i.e., he was actually describing the molar. Whatever the case historically, our examination of the mandibles of recently collected *P. tuckeri* from Bermuda (Fig. 1) reveals a molar matching precisely that described by Shoemaker (1933) for *H. seclusus* and by Barnard (1979) for *H. galapagoanus. Pariphinotus* and *Heterophlias* are therefore indistinguishable genera with respect to their mandibular molars.

Kunkel (1910) described *Pariphinotus* as not

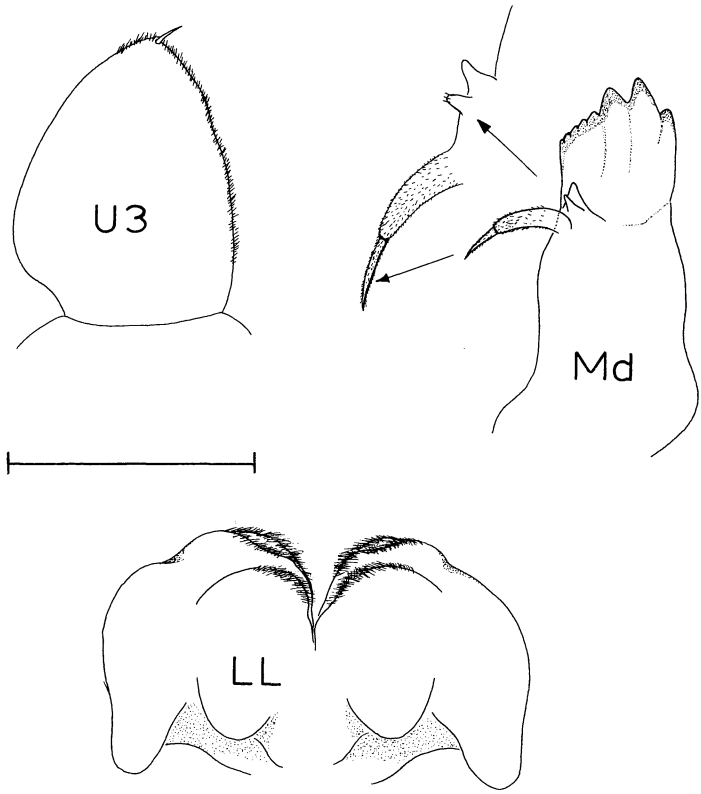

Fig. 1
Pariphinotus tuckeri Kunkel. YPM No. 8720: U3, uropod 3. USNM Acc. No. 346847: Md, mandible; LL, lower lip. Scale bar = 0.1 mm.

having inner lobes on the lower lip and there was no figure. Wakabara and Pereira Leite (1977) noted that *Heterophlias* differs from *Pariphinotus* in possessing inner lobes on the lower lip; inner lobes were also described by Shoemaker (1933). Wakabara and Pereira Leite (1977) suggested that Kunkel may have overlooked the inner lobes. Recently collected specimens from Bermuda do have inner lobes on the lower lip (Fig. 1); they are, however, extremely difficult to discern, particularly if the lip is viewed from the opposite side. (Barnard's (1979) figure of *H. galapagoanus* does not show inner lobes on the lower lip, but he obviously figured the lip from the outside.) The presence or absence of inner lobes on the lower lip is, then, also not a difference between *Pariphinotus* and *Heterophlias.*

Recently, another character was mentioned in the literature that differs from our observations for the *Pariphinotus*/*Heterophlias* complex. Ledoyer (1986) enigmatically suggested the presence of a vestigial mandibular palp for *Heterophlias.* A diagnostic feature of the Phliantidae is the lack of a mandibular palp, and we can find nothing in the literature on *Heterophlias* to which such a statement could be ascribed.

As already mentioned, the possibility of a synonymy for *Pariphinotus* and *Heterophlias* has been raised several times in the last few decades. Although Barnard (1979) stated that *Pariphinotus* is probably a senior synonym of

Heterophlias, all other references to a synonymy, including a later one by Barnard (1981), implied *Heterophlias* should be the valid generic name, in the event a synonymy could be demonstrated. Although Kunkel's (1910) description of *Pariphinotus* lacked a detailed analysis of the mouthparts and was incorrect with respect to uropod 3, Shoemaker's (1933) *Heterophlias,* as demonstrated in this paper, undoubtedly belongs to the same genus. As Kunkel's description of *Pariphinotus* preceded the description of *Heterophlias,* the latter must be regarded as a junior synonym of *Pariphinotus.* A synonymy and emended description for *Pariphinotus* Kunkel, 1910, are provided.

***Pariphinotus* Kunkel 1910 (emended)**

Pariphinotus: Kunkel, 1910:19. Barnard, 1958: 111. Barnard, 1964:67. Barnard, 1969a:411, Barnard, 1981:1214, 1216.
Heterophlias: Shoemaker, 1933:250. Barnard, 1958:110. Barnard, 1964:67. Barnard, 1969a: 410. Barnard, 1981:1214, 1216. Ledoyer, 1982: 14.
Pariphinotus tuckeri: Kunkel, 1910:19–21, fig. 6. Barnard, 1958:111. Mills, 1964:2–3. Barnard, 1969a:411. Johnson, 1986:378–79, fig. 125.
Heterophlias seclusus: Shoemaker, 1933:250–52, figs. 4–5. Barnard, 1958:110. Barnard, 1969a:410, figs. 145–47. Barnard, 1972:193. Wakabara and Pereira Leite, 1977:90–96, figs. 1–4. Nelson, 1978:103. Nelson, 1979:66.
Heterophlias seclusus escabrosa: Barnard, 1962:79–80, fig. 5. Barnard, 1969b:195–96. Barnard, 1969c:219. Barnard, 1979:131, fig. 40.
Heterophlias seticoxae: Ortiz, 1976:21–35, figs. 1–3.
Heterophlias galapagoanus: Barnard, 1979: 131–33, figs. 70–72.

Type Species

Pariphinotus tuckeri Kunkel.

Type Locality

Bermuda.

Diagnosis

Mandibular molar conical, terminating in a large spine, lower lip possessing inner lobes, maxilla 1 lacking palp, maxillipedal palp 4-articulate, gnathopods simple, inner ramus of pleopod 3 one-half length of outer ramus, uropod 3 lacking rami.

Material Examined

YPM 5613. 5.5 mm ♀. **Paralectotype.** Bermuda. W. G. Van Name. 1901. YPM 8720. 4.24 mm ♂. Ferry Reach, St. George's, Bermuda. M. F. Gable. 25 May 1985. YPM 8739. 2.7 mm ♀. North side of Shelly Bay, Hamilton, Bermuda. E. A. Lazo-Wasem. 28 May 1987. Depth: 0.6m. Within pieces of limestone on sandy bottom. YPM 8740. 1.6mm immature. North side of Shelly Bay, Hamilton, Bermuda. E. A. Lazo-Wasem. 28 May 1987. Depth: 0.6m. Within pieces of limestone on sandy bottom. YPM 8741. 3.9 mm ♂. Whalebone Bay, St. George's, Bermuda. A. J. Baldinger. 22 May 1987. Depth: 1m. From *Thalassia.* USNM 346847. Bermuda. Ferry Reach, St. George's, Bermuda. M. L. Jones. 2 September 1981.

Acknowledgments

This study was supported in part by a Samuel Riker Fellowship from the Bermuda Biological Station to the first author. Funding to the first author was also provided by the Peabody Museum of Natural History, Yale University, and the Eastern Connecticut State University Foundation. A Connecticut State University Research Grant provided partial support for the third author.

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