First notice of the family Coleiidae Van Straelen
(Crustacea: Decapoda: Eryonoidea) from the upper
Triassic of Japan

Authors: KARASAWA, HIROAKI, TAKAHASHI, FUMIO, DOI, EIJI, and
ISHIDA, HIDEO

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HIROAKI KARASAWA, FUMIO TAKAHASHI, EIJI DOI AND HIDEO ISHIDA

1Mizunami Fossil Museum, Yamanouchi, Akeyo, Mizunami, Gifu 509–6132, Japan (e-mail: GHA06103@nifty.ne.jp)
2Mine City Museum of History and Folklore, Omine, Mine, Yamaguchi 759–2292, Japan
3c/o Mine City Museum of History and Folklore, Omine, Mine, Yamaguchi 759–2292, Japan

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Abstract. Coleia azuma sp. nov., a lobster of the polychelidan family Coleiidae, is described from the upper Triassic (Carnian) Nakatsuka Formation of the Mine Group in Yamaguchi Prefecture, southwest Japan. The discovery of C. azuma greatly extends the geologic range for the genus back to the late Triassic. This species represents the first and oldest records of a Triassic decapod in the western Panthalassic realm.

Key words: Coleiidae, Crustacea, Decapoda, Japan, Mine Group, Triassic

Introduction

The Coleiidae Van Straelen, 1924, an extinct family within the superfamily Eryonoidea De Haan, 1841, is a small group including five genera, Coleia Broderip, 1835, Hellerocaris Van Straelen, 1924, Proeryon Beurlen, 1928, Pseudocolea Garassino and Teruzzi, 1993, and Tropyper Gould, 1857 (Glassnaver, 1969; Duffin, 1978; Garassino and Teruzzi, 1993; Schweigert, 2000). In his review of the genus Coleia Broderip, 1835, Pina (1968) recognized 13 species from the lower Jurassic of Europe. Subsequently, Teruzzi (1990) described two additional new species from the lower Jurassic of Italy, Coleia occurs outside Europe in the lower Jurassic of Siberia (Tschermshev, 1930), the lower Jurassic of India (Feistmantel, 1877), and the upper Jurassic of Madagascar (Secretan, 1964). Schweigert and Dietl (1999) removed Eryon longipes Fraas, 1855, from the upper Jurassic of Germany, from Palaeopolychelides Von Knebel, 1907 (Polychelidae Wood-Mason, 1874) to Coleia based upon examination of well-preserved specimens. Garassino and Teruzzi (2001) assigned Proeryon bazzensis Kuhn, 1952, from the lower Jurassic of Europe to Coleia. Thus, most members of Coleia are known from the lower-upper Jurassic in the western Tethys realm and only Coleia siberica Tschermshev, 1930, occurs from the lower Jurassic in the northeast Panthalassic realm.

The purpose of this paper is to describe a new species of Coleia from the Nakatsuka Formation of the Mine Group (upper Triassic), deposited on the Akiyoshi Terrane, southwest Japan. The specimens were collected from shale of the Nakatsuka Formation exposed at Tsubuta (Loc. MN-1; 34°17‘30”N, 131°7‘20”E), Sanyo-cho, Yamaguchi Prefecture (Figure 1). Coleia occurred in association with fragments of a peneaeld, pelecypods, Halobia spp., ammonites, and plants. Tokuyama (1962) indicated based upon pelecypods that the geologic age of the Nakatsuka Formation was Carnian (late Triassic). The presence of Trachyceras cf. T. desatoyense Johnston, 1941, from the formation further shows that its geologic age is early Carnian (Ishibashi et al., 1990).

The described specimens are housed in the Mine City Museum of History and Folklore, Omine, Mine, Yamaguchi 759–2292, Japan.

Systematics

Infraorder Polychelida Wood-Mason, 1874
Superfamily Eryonoidea De Haan, 1841

Remarks.—The Eryonoidea has traditionally been included within the infraorder Palinura Latreille, 1802 (i.e., Glaessner, 1969; Holthuis, 1991; Martin and Davis, 2001). However, Scholtz and Richter (1995) and Schram (2001) showed based upon cladistic analysis that the Palinura was a paraphyletic taxon and the Polychelida was the most basal clade within the reptantian decapods. According to Scholtz and Richter (1995), the Eryonoidea is here placed within the Polychelida.
Genus *Coleia* Broderip, 1835

**Emended diagnosis.**—Carapace ovate, flattened dorsoventrally, much longer than wide; rostrum indented medially; orbital sinus deeply concave or V-shaped; cervical and postcervical incisions deep; lateral margin convex; posterior margin concave; median postrostral carina and postorbital carinae present; cervical groove deep and postcervical groove shallow; median postcervical carina and branchial carinae present. Abdominal somites broad, depressed dorsoventrally; tergum of somite 1 short, fused pleura; all terga with median tergal carina; pleura of somites 2–6 well-developed; telson lanceolate or triangular; uropodal endopod and exopod ovate; exopod ovate with diaphragm. Antennal scaphocerite large, ovate. Eye present. Pereiopods 1–4 chelate; pereiopod 1 usually slender, elongate.

**Type species.**—*Coleia antiqua* Broderip, 1835 by monotypy.

**Other species.**—*Coleia cfr. antiqua* (in Pinna, 1968); *Coleia banzensis* (Kuhn, 1952); *Coleia cfr. C. banzensis* (in Garassino and Teruzzi, 2001); *Coleia barrovensis* (McCoy, 1849); *Coleia cfr. C. barrovensis* (in Feistmantel, 1877); *C. bredonensis* Woods, 1925; *C. brodiei* (Woodward, 1866); *C. crassichelis* (Woodward, 1866); *C. edwardsi* (Moridre, 1864); *C. escheri* (Oppel, 1862); *C. incerta* Secretan, 1964; *C. longipes* (Fraas, 1855); *C. mediterranea* Pinna, 1968; *C. moriirei* (Renault, 1889); *C. pinnae* Teruzzi, 1990; *C. popeyi* Teruzzi, 1990; *C. siberica* Tschernyshev, 1930; *C. sinuta* Beurlen, 1928; *C. tenuichelis* Woods, 1925; *C. uzume* sp. nov.; *C. viali* Pinna, 1968; *C. wilmscoensis* (Woodward, 1866).

**Geologic range.**—Late Triassic to late Jurassic.

*Coleia uzume* nov.

**Figures 2.1–2.5, 3**

Abdomen about as long as carapace. Abdominal somites broad, depressed dorsoventrally, poorly preserved. Terga of somites 1–6 finely granulate dorsally, with marginal furrow and smooth, ridged median tergal carina. Tergum of somite 1 short, fused pleura; ventrolateral margin slightly convex with sharp posteroverentral corners. Pleura of somites 2–4 not preserved; pleura of somites 5 and 6 poorly preserved; pleura of somite 6 bounding tergum by weak, transverse ridge, with rounded ventrolateral margin. Telson much longer than wide, lanceolate, tapering posteriorly, with median carina and submedian carinae dorsally. Uropodal endopod and exopod poorly preserved; exopod with diarensis.

Pereiopod 1 chelate, slender. Dactylus slender, elongate, about as long as palm, with ventrally hooked tip. Fixed finger also slender, elongate, equal to dactylus length, with upturned tip. Carpus short, about 1/3 propodus length. Merus about as long as propodus.

Pereiopods 2–5 unknown.

Material examined.—MMHF-00039 (holotype), MMHF-00040-00043 (paratype).

Discussion.—Coleia uzume sp. nov. possesses characters of the carapace and pereiopods 1 most like those of C. tenuchelis Woods, 1925, from the lower Sinemurian of Lyme Regis, England. However, the presence of inner branchial carinae on the dorsal carapace readily distinguishes the present species from C. tenuchelis. Coleia uzume resembles Coleia antiqua Broderip, 1835 from the lower Sinemurian of Lyme Regis (Broderip, 1835; Woods, 1925), but differs in having inner branchial carinae on the carapace and shorter propodi of pereiopods 1. In Coleia antiqua, the dactyl and fixed fingers are much shorter than the palm, while in C. uzume they are about half the propodus length.

In his review of Mesozoic decapods from Japan, Karasawa (2001) listed 22 species in 17 genera from lower Jurassic (Toarcian)-upper Cretaceous (Maastrichtian) deposits. Among these, Uncinia pacifica Schweigert et al., 2003 (Uncinidae Beurlen, 1928), described from the Toarcian Toyora Group in Yamaguchi Prefecture by Karasawa (2002) and Schweigert et al. (2003), has been the previously known oldest record in Japan. Coleia uzume is the first and oldest recorded occurrence of a Triassic decapod in Japan.

Two coleid genera have been previously known from upper Triassic deposits: Pseudocolea Garassino and Teruzzi, 1993, from the Norian-Rhaetian of Italy (Garassino and Teruzzi, 1993; Garassino et al., 1996) and Tropifer Gould, 1857, from the Rhaetian of England (Duffin, 1978). The discovery of Coleia uzume from the Carnian of Japan represents the oldest record for not only the genus but also the family.

The Eryonoida is represented by four families,
Triassic coleoid decapod from Japan

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Coleidae, Eryonidae De Haan, 1841 (late Triassic–early Cretaceous), Polychelidae Wood-Mason, 1874 (middle Jurassic–Recent), and Tetraclathridae Beurlen, 1930 (late Triassic). Most genera excluding polychelids have been known from the western Tethys realm. Fossil members of the Polychelidae are recorded from the middle-upper Jurassic of Europe (Glaessner, 1969), the upper Jurassic of Antarctica (Aguirre-Urreta et al., 1990), and the lower Oligocene of western North America (Schweitzer and Feldmann, 2001). The recent polychelids are cosmopolitan in distribution (Galil, 2000). Among eryonoid genera Rosenfelda Garassino et al., 1996, Pseudocoleoa, Tetrachela Reuss, 1858, and Tropifer are known from upper Triassic deposits. The recognition of Coleia from Japan greatly extends the known geographic range for the Triassic Eryonoida to the west side of the Panthalassic Ocean.

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