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The identify of *Paramursia circularis* Karasawa, 1989, with notes on *Mursilata* Hu and Tao, 1996 (Decapoda: Brachyura: Calappidae)

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Abstract

The identify of a poorly known species of a fossil calappid, *Paramursia circularis* Karasawa, 1989, from the Early–Middle Miocene Mizunami Group of Japan, is herein re-examined. *Paramursia circularis* is moved to an another calappid *Mursiopsis* Ristori, 1889. Two calappid genera, *Paramursia* Karasawa, 1989, and *Mursilata* Hu and Tao, 1996, are considered as a junior subjective synonym of *Mursiopsis*. Occurrences of the Miocene species from Japan and Taiwan greatly expand the geographic and geologic range for the genus previously known only from the Early Oligocene of Italy. A revised diagnosis is provided for *Paramursia circularis*.

Key words: Decapoda, Brachyura, Calappidae, Miocene, Mizunami Group, Japan

Introduction

Karasawa (1989) described *Paramursia circularis* Karasawa, 1989, a new genus and species of Calappidae De Haan, 1833, from the Early–Middle Miocene Mizunami Group of Gifu Prefecture, central Japan. Later, Schweitzer and Feldmann (2000) synonymised *Paramursia* with *Mursia* Leach in Desmarest, 1823, and moved *P. circularis* to *Mursia*. Several authors (i.e., Schweitzer et al., 2010) agree with their assignment.

Re-examination of the type and additional specimens of *P. circularis*, however, shows that *Paramursia* should be assigned to *Mursiopsis* Ristori, 1889. Additionally, the taxonomic status of *Mursilata* Hu and Tao, 1996, is discussed.

Institutional abbreviation

MFM: Mizunami Fossil Museum, Yamanouchi,

Akeyo, Mizunami, Gifu 509-6132, Japan.

Systematics

Family Calappidae De Haan, 1833

Genus *Mursiopsis* Ristori 1889

Mursiopsis Ristori, 1889, p. 405 (*type species*: *Mursiopsis pustulosus* Ristori 1889, p. 405, pl. 15, figs. 6–8, by monotypy).

Paramursia Karasawa, 1989, p. 15 (*type species*: *Paramursia circularis* Karasawa, 1989, p. 16, pl. 3, fig. 7 (non fig. 8), by monotypy).

Mursilata Hu and Tao, 1996, p. 69 (*type species*: *Platymaia kilmeri* Hu, 1981, p. 72, pl. 1, figs. 1, 6, 9, by original designation).

Species included: *Mursiopsis chuangi* (Hu and Tao, 1996), new combination, from the Middle Miocene of Taiwan; *M. circularis* (Karasawa, 1989)

new combination, from the early Middle Miocene of Japan; *M. kilmeri* (Hu, 1981), new combination, from the Middle Miocene of Taiwan; *M. pustulosus* Ristori, 1889 (type), from the Early Oligocene (Rupelian) of Italy; *M. tzengi* (Hu and Tao, 1996), new combination, from the Late Miocene of Taiwan.

Diagnosis: Subpentagonal convex carapace, three-lobate; maximum width in anterior part; convex undulate anterolateral margins indistinct from the slightly concave posterolateral margins; short straight posterior margin slightly convex at the middle; posterolateral margin with three alternate rounded tubercles; frontal and postorbital regions depressed compared to the remainder carapace; dorsal carapace tuberculate, with four irregular, alternate subrounded, tubercles arranged in longitudinal rims; deep gastro-branchial sinuous grooves, diverging frontally (Pasini et al., 2019, p. 223).

Discussion: *Mursiopsis* Ristori, 1889, has been a monotypic genus with the type species, *Mursiopsis pustulosus* Ristori, 1889, only known from the Early Oligocene (Rupelian) of Italy. Allasinaz (1987) and Pasini et al. (2019) gave the detailed description to *M. pustulosus*.

Paramursia Karasawa, 1989, has been monotypic with *P. circularis* Karasawa, 1989, from the early Middle Miocene of Japan. Later, Schweitzer and Feldmann (2000) synonymised *Paramursia* with *Mursia* Leach in Desmarest, 1823, because *P. circularis* had the similarities of the carapace morphology with *Mursia aspina* Schweitzer and Feldmann, 2000, a representative of the species-group lacking lateral spines. Re-examination of the type and additional specimens collected from the type locality of *P. circularis* shows that the species is characterized by the presence of a short lateral spine and a short posterolateral spine above the lateral corner of the posterior margin, and the absence of lobes and/or spines of the lateral corner of the posterior margin. These characters cannot be observed in *Mursia*. Indeed, several species of *Mursia* have a more or less well-developed lateral spine, lobes at the lateral corner of the posterior margin, and an entire posterolateral margin without spines (Galil, 1993; Schweitzer and Feldmann, 2019). The diagnostic characters of *Paramursia*

fit those of *Mursiopsis*. Therefore, *Paramursia* can be considered as a junior subjective synonym of *Mursiopsis* and *P. circularis* can be assigned to *Mursiopsis*.

Mursilata Hu and Tao, 1996, was established with the type species, *Platymaia kilmeri* Hu, 1981, and two species, *M. chuangi* Hu and Tao, 1996, and *M. tzengi* Hu and Tao, 1996, from the Middle to Late Miocene of Taiwan. Karasawa (1997) synonymised *Mursilata* with *Paramursia* based upon the overall characters of the carapace, whereas De Grave et al. (2009), Schweitzer et al. (2010), and Schweitzer and Feldmann (2019) treated it as a separate genus within Calappidae. However, *Mursilata* should be considered as a junior synonym of *Mursiopsis* based upon a subovate carapace with five dorsal tuberculated ridges, one short lateral spine and the posterolateral margin bearing a pair of short spines.

These occurrences of the Miocene from Japan and Taiwan greatly expand the known geographic and geologic range for the genus *Mursiopsis*.

***Mursiopsis circularis* (Karasawa, 1989),
new combination**

(Figs. 1.1a–3c)

Paramursia circularis Karasawa, 1989, p. 16, pl. 3, fig. 7 (non fig. 8); Karasawa, 1993, p. 47, pl. 8, fig. 11; Karasawa, 1997, p. 43, pl. 8, fig. 13.

Mursia circularis (Karasawa); Schweitzer and Feldmann, 2000, p. 236; Schweitzer et al., 2010, p. 84.

Emended diagnosis: Carapace subcircular, slightly wider than long, widest at about mid-length, highly vaulted transversely and longitudinally. Fronto-orbital width about 43 percent maximum carapace width. Front narrow, medially sulcate. Anterolateral margins strongly convex, weakly tuberculate. Lateral spine short, triangular, slightly directed posterolaterally, continued from outer ridge of dorsal surface.

Posterolateral margins weakly concave, rimmed; short, triangular, posterolaterally directed spine present just above lateral corner of posterior margin, continued from inner ridge on dorsal surface. Posterior margin slightly narrower than fronto-orbital margin, just above lateral corner of posterior margin, continued

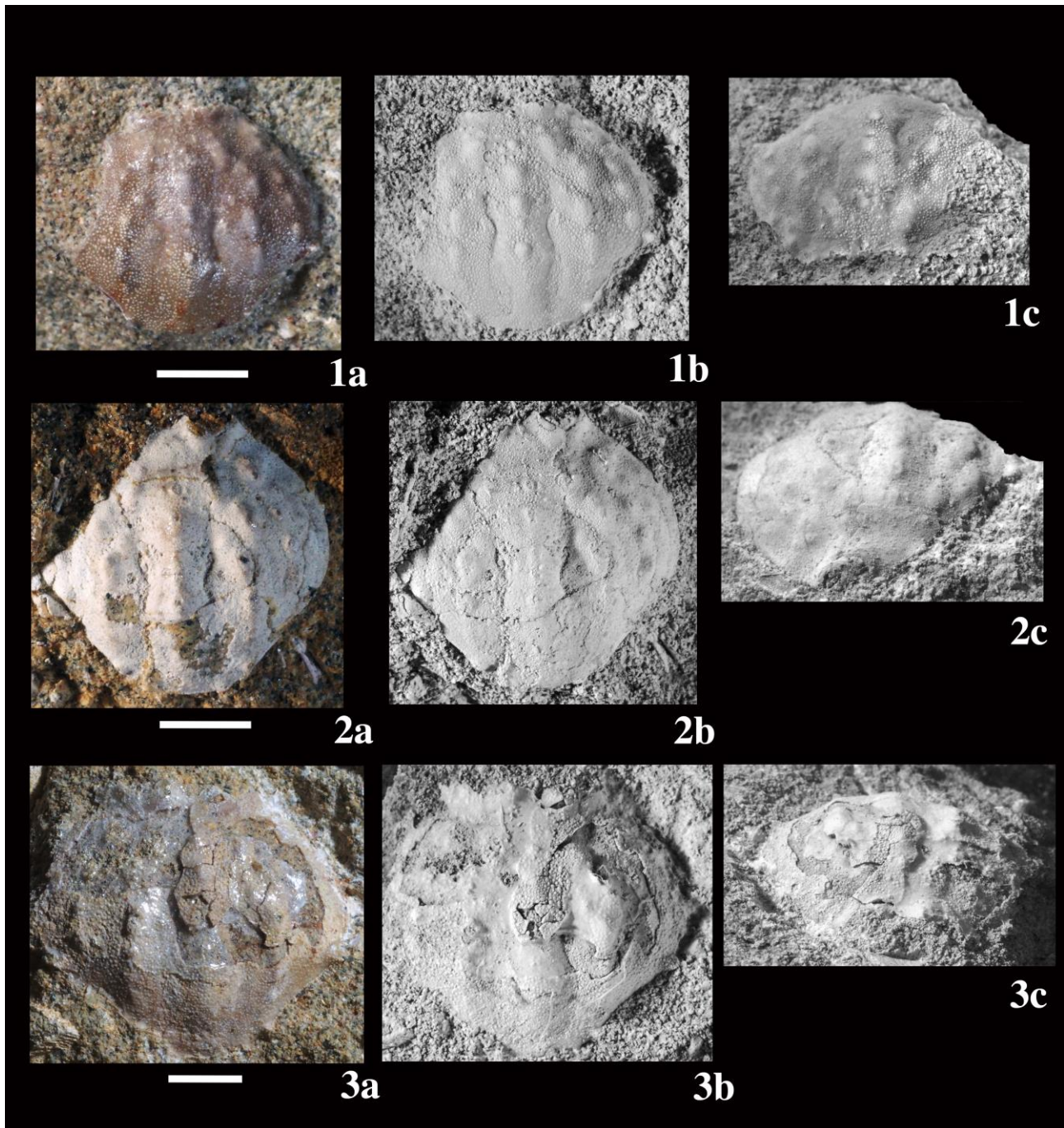


Fig. 1a–3c. *Mursiopsis circularis* (Karasawa, 1989), new combination. *1a–c*, MFM9013 (holotype); *2a–c*, MFM9131; *3a–c*, MFM9131-2. a, b, carapace of dorsal view; c, carapace of frontal view. Scale bar = 5 mm. Figs. 1b, 1c, 2b, 2c, 3b, and 3c are whitening images coated with ammonium chloride sublimate.

from inner ridge on dorsal surface. Posterior margin slightly narrower than fronto-orbital margin, weakly convex, rimmed. Dorsal surface finely granular with five well-developed ridges of tubercles.

Material examined: MFM9013 (holotype), MFM9131, and MFM9131-2, all from sandstone of the Shukunohora Facies (Early Middle Miocene) of the Akeyo Formation, Mizunami Group from Ogino-

shima (Loc. MFM. 07 of Karasawa, 1993), Kamigiri, Kamado-cho, Mizunami City, Gifu Prefecture, Japan.

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