

A fossil homolodromiid crab from King George Island, Antarctica

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Abstract *Homolodromia inflata* (Förster) described in this paper is found from the Miocene Cape Melville Formation of the glacio-marine sediments in King George Island, Antarctica. A comparison is made between the genera *Homolodromia* and *Antarctidromia* and a discussion is also made on the taxonomic placement of the genus *Homolodromia* in the Brachyura, we would like to consider that the genus *Antarctidromia* previously identified by Förster, may be a synonym of the genus *Homolodromia*.

Key words Homolodromiid crab, King George Island, Antarctica.

1 Introduction

Since the genus *Homolodromia* was firstly erected by Edwards in 1880, four species have been grouped under this genus. *H. paradoxa* Edwards (1880) was collected at a depth of 651 m in the Leeward Islands of the Caribbean; *H. bouvieri* Doflein (1904) was known from Kenya, Mozambique (Martin, 1992) and South Africa; *H. robertsi* Garth (1973) was found from the coast of Peru and Chile. The three species mentioned above are present in the deeper waters off the coast of Southern Hemisphere. The fourth species, *H. chaneyi* Feldmann (1988), a fossil homolodromiid crab, was found from the Eocene La Meseta Formation in Seymour Island, Antarctica. *H. inflata* (Förster, 1985), described in this paper as a fossil form, was preserved in the glacio-marine Cape Melville Formation of King George Island, Antarctica. The species identified as *Antarctidromia inflata* by Förster (1985, 1987), was found in the same location of our specimens. Our study indicates that the genus *Antarctidromia* appears to be a synonym of the genus *Homolodromia*. It should be noted that Baez and Martin (1989) considered

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"*Arachnodromia baffini*" from India and Indo-Pacific Ocean to be a synonym of *H. baffini*. And so, six living and fossil homolodromiid species have been involved in the genus *Homolodromia* so far.

2 Materials

This paper is to report a species of the fossil homolodromiid crabs collected by Prof. Li Haomin of Nanjing Institute of Geology and Palaeontology, Academia Sinica during the ninth Chinese National Antarctic Research Expedition 1992-1993. Found from the glacio-marine sediments of the Cape Melville Formation in King George Island, Antarctica (Fig. 1) are more than twenty crab specimens dominated by well-preserved dorsal and ventral carapaces together with a few of chelipeds and pereiopods, but without an individual crab. These dorsal and ventral carapaces show that the features of this species seem to be the same as these of *Antarctidromia inflata* identified by Förster (1985, 1987), which occurred in the same area with our specimens.

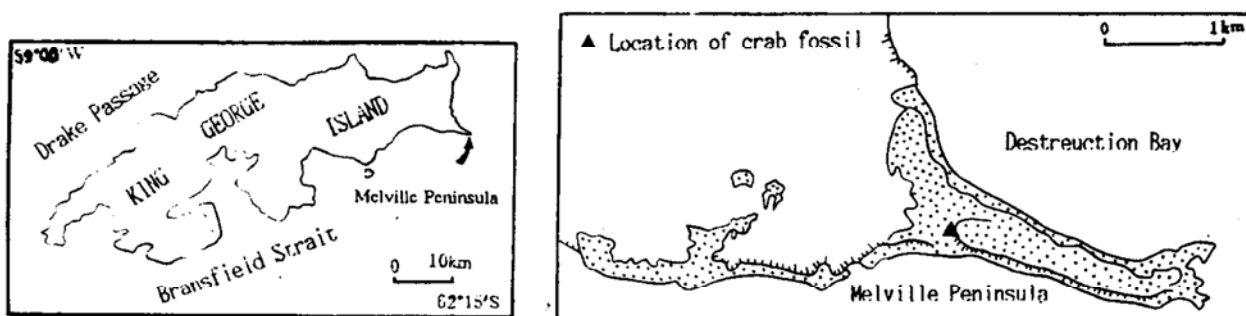


Fig. 1. Location of crab fossil.

3 Description of species

Order Decapoda Latreille, 1803

Suborder Pleocyemata Burkenroad, 1963

Infraorder Brachyura Latreille, 1803

Section Dromiacea De Haan, 1833

Superfamily Dromioidea De Haan, 1833

Family Homolodromiidae Alcock, 1899

Genus *Homolodromia* A. Milne Edwards, 1880

Homolodromia inflata (Förster) (pl. 1, figs. 1-10)

1983, Dromiacea Birkenmajer, Gazdzicki and Wrona, p. 58, figs. d, e; 1985, *Antarctidromia inflata* Förster, p. 342-348, figs. 2, 3; 1987, p. 153-158, pl. 36, figs. 1-5; pl. 37, figs. 1-6; pl. 38, figs. 1, 2; pl. 39, figs. 1-4; pl. 40, figs. 1-

3; pl. 41, figs. 1—6.

(1)Description. Carapace convex, longer than wide, pear-shaped in outline, 33~48 mm in length, 29~37 mm in width, with the greatest width in posterior third. Frontal region narrow, containing a pair of strongly and monoserrulately preorbital spines and a small frontal spine. Antennoorbital cavity narrow, exorbital and antennal spines unseen. Hepatic spine prominent, two small bosses just behind hepatic spine and on the anterior of cervical groove. Distinct cervical groove cuts through anterior third of the dorsal surface and crosses over the hepatic and urogastric grooves. Epigastric region weakly swollen, separates the epigastric groove from convex protogastric lobe. Mesogastric lobe large, flattened, like a turnovered infundibulum. Two small posterior gastric pits shown in the middle part of the cervical groove. Urogastric region inflated, bilobed-shaped. Urogastric and hepatic grooves separate cardiac region and hepatic lobe from epibranchial region and protogastric lobe respectively. Epibranchial region bordered by gastric-cardiac markings, cervical and branchiocardiac grooves. Mesobranchial and metabranchial regions meeting, with a kidney-shaped inflation which is parallel to posterior cardiac markings. Branchiocardiac groove distinct. Cardiac region narrow, flattened, a weak longitudinal ridge extends from the cervical groove into the cardiac region (Fig. 2a). Intestinal region depressed, with a pair of weak backward diverging ridges. Posterior margin narrow. Abdomen of male is composed of seven segments, of which the first two segments exposed dorsally, the remainder folded ventrally and the sixth segment lengthened. Telson large, subtriangular. The third maxillipeds partly preserved, the first pereopods with slender chela, the second and the third pereopods slender, the fourth and the fifth ones reduced in size and subdorsal position. Entire surface ornamented by small granules except for grooves, markings and dactylus and fixed finger of chela (Fig. 2b).

(2)Remarks. This species is similar to *Homolodromia chaneyi* Feldmann (1988) from the Eocene La Meseta Formation, Seymour Island, NW Antarctica in the regional and groovy patterns on the dorsal carapace, but *H. chaneyi* differs from *H. inflata* in that the latter has a pentagonal dorsal carapace, with the maximum width near posterolateral corner, but without a longitudinal ridge extending from the cervical groove into the cardiac region on the dorsal surface, the cephalic and thoracic regions are nearly equal in width, the gastric regions are swollen and weakly inflated.

4 Discussion

Since the genus *Homolodromia* was erected by Edwards in 1880, its placement in the brachyura has given rise to much controversy. Rathbun (1937) placed this genus in the Family Homolodromiidae, which was included along with the Dromiidae and Dynomenidae in the Superfamily Dromiidea. Balss (1957) followed and developed Rathbun's opinion, he divided the Superfamily Dromiacea into seven family, namely, Eocarcinidae, Prosoptonidae, Dakaticancriidae, Homolodromiidae, Dromiidae, Dynomenidae and Homolidae, and he also considered that the brachyura was a monophyletic evolution, belonging to the most primeval crabs and was the progenitors of all true crabs. Then,

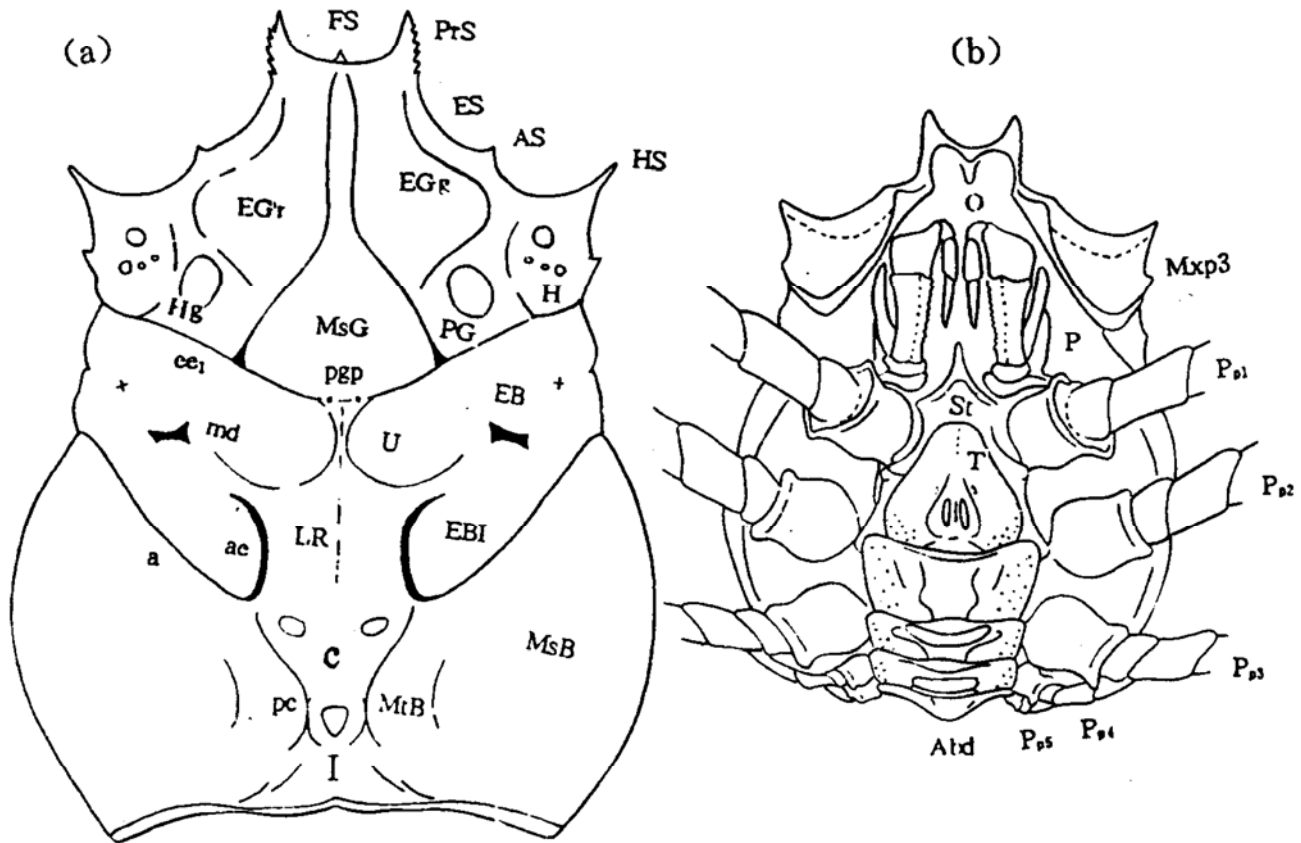


Fig. 2. *Antarcticidromia inflata* Förster (1985, 1987). (a) Terminology of carapace regions and grooves. Dorsal view; a: branchiocardiac groove; ae: lateral gastrocardiac muscle; As: antennal spine; ce₁: cervical groove; EB: epibranchial region; EBI: epibranchial lobe; EGg: epigastric groove; EGr: epigastric region; ES: exorbital tooth; C: cardiac region; FS: frontal spine; H: hepatic lobe; Hg: hepatic groove; HS: hepatic spine; I: intestinal region; LR: longitudinal ridge; md: median dorsoventral muscle; MsG: mesogastric lobe; MsB: mesobranchial region; MtB: metabranial region; Pc: posterior cardiac markings; PG: protogastric lobe; PGP: posterior gastric pits; PrS: preorbital spine; U: urogastric region. (b) Ventral view: Abd: abdomen; O: antennoorbital cavity; Mxp3: third maxillipeds; P: pterygostomial region; Pp1: first pereiopods; Pp2: second pereiopods; Pp3: third pereiopods; Pp4: fourth pereiopods; Pp5: fifth pereiopods; St: sternum; T: telson.

Glaessner (1969) divided the Section Dromiacea into three Superfamilies, the Homoloidea, the Dakoticancroidea and the Dromioidea which embraces four families, the Eocarcinidae, the Dromiidae, the Dynomenidae and the Prosopidae. The last family is comprised of three subfamily, the Prosopinae, the Pithonotinae and the Homolodromiinae. The subfamily Homolodromiinae was distinguished from other families in the superfamily Dromioidea by strongly developmental cervical and brachio-cardiac grooves. Guinot (1977, 1978) proposed a new classification of the brachyurans based on the placement of the genital openings, including three sections, the Podotremata, the Heterotremata and the Thoracotremata. The Podotremata was divided into two subsections, the Archaeobrachyura and the Dromiacea which consists of two superfamilies and three families, the Homolodromioidea (the Homolodromiidae) and the Dromioidea (the Dromi-

idae and the Dynomenidae). She still further considered the Prosopidae to be the ancestors of the Homolodromiidae of the deep-water animals. In 1980, Rice divided a separate superfamily Dromiacea into three families, the Homolodromiidae, the Dromiidae and the Dynomenidae according to the study of the crab zoeal morphology. Bowman and Abele (1982), following some important conclusions of the above authors and some recent results of the classification in the brachyurans, considered that the dromiids were not a true crabs and that they were the forefather of the Eubrachiurans according to the information of morphology, palaeontology and crab zoeal development. In this paper the authors follow Bowman and Abele's classification. The diagnosis of the genus *Homolodromia* is as follows: Carapace longer than wide, narrow, wider behind than in the front, convex in both directions, with a sharp lateral margin. Distinct cervical and branchiocardiac grooves and well-developed regions are showed in the dorsal carapace. There is no dorsal lineae. The abdomen of male consists of seven segments, of which two are visible in the dorsal aspect. The last two pereopods are reduced in size.

The diagnosis of the genus *Antarctidromia* proposed by Förster (1985, 1987) is as follows: "Carapace longer than wide, pear-shaped, dorsoventrally compressed, with lateral margin. Antennoorbital region narrow, without orbits. Regions of carapace well delimited by deep grooves and significant lateral gastrocadiac markings. Narrow, median fused thoracic sterna with lateral protuberances. Abdominal segments with well-developed pleura. First and second ambulatory legs slender, longer than chelipeds, fifth and sixth pereopods reduced and shifted to a subdorsal position."

The diagnosis of the genus *Homolodromia* is similar to that of the genus *Antarctidromia*, therefore, it is feasible to consider the genus *Antarctidromia* to be the synonym of the genus *Homolodromia*.

Range and Occurrence: Late Cretaceous-Recent; Worldwide (largely found in High latitudes of the southern hemisphere).

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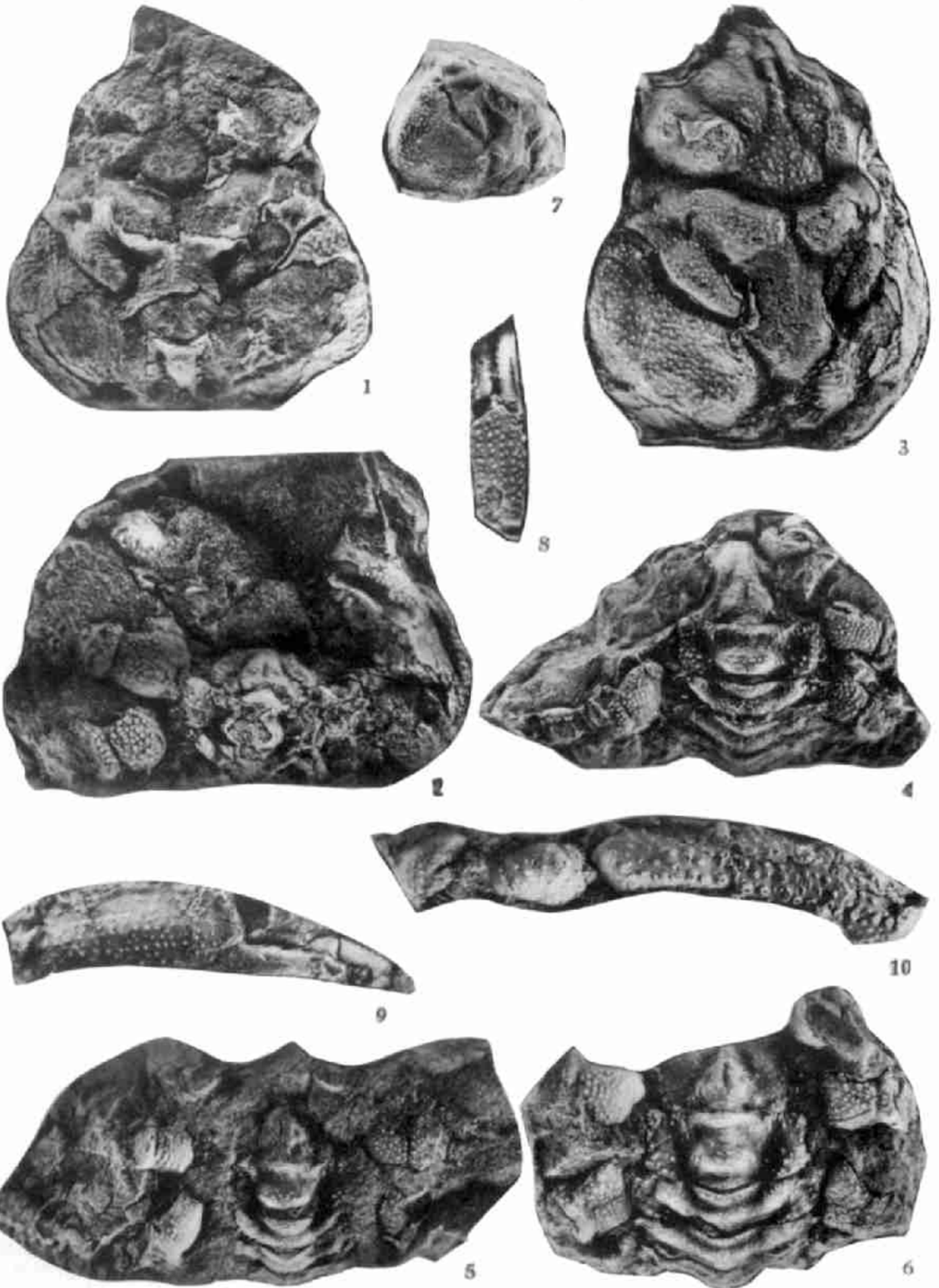
Explanation of Plate 1*

Homolodromia inflata (Förster, 1985, 1987)

- | | |
|---|---|
| 1, 2. dorsal and ventral view of carapace, × 2, | 6. ventral view of carapace, × 1, 123615. |
| Registered No: 123611. | 7. dorsal view of carapace (part), × 1, 123616. |
| 3. dorsal view of carapace, × 1.5, 123612. | 8. chela (part), × 1, 123617. |
| 4. ventral view of carapace, × 1, 123613. | 9. chela (part), × 1, 123618. |
| 5. ventral view of carapace, × 1, 123614. | 10. pereopod (part), × 1.5, 123619. |

* All specimens are housed in Nanjing Institute of Geology and Palaeontology, Academia Sinica.

Plate 1



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