

Additions to the description of *Costacopluma concava* Collins and Morris, 1975 (Brachyura, Retroplumidae)

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Abstract

A small collection of the retroplumid crab, *Costacopluma concava* Collins and Morris, 1975 from the Upper Cretaceous of Niger, not only extends the northerly range of the species in Africa, but allows the first description of an associated cheliped to be made, as well as a partial description of female sternites and abdomen belonging to that species.

Key words: *Costacopluma*, male cheliped, female abdomen

Introduction

The retroplumid crab, *Costacopluma concava* Collins and Morris, 1975, from the late Cretaceous, Campanian to ?Maastrichtian, of Nigeria, was described from carapaces and male abdomina. The geographic range of the species was extended to Kashmir by Gaetani *et al.* (1983). The discovery of that species in the early Maastrichtian of Niger not only extends its northerly range, but, more importantly, allows an associated cheliped to be described as well as partial description of the female sternites and abdomen, both components hitherto unknown in this species.

Since 1975, a further eight species have been described. Only one of these, *Costacopluma bifida* Collins *et al.*, 1994, from the Palaeocene Guasare Formation of Venezuela, was in possession of associated chelipeds – albeit poorly displayed, and only one other female abdomen, that of *Costacopluma binodosa* Collins and Wienberg Rasmussen, 1992, from the Late Campanian of Ikorfat, West Greenland, has been described. Thus, the inclusion among a collection of *Costacopluma concava* from the late Cretaceous, Maastrichtian of Niger and deposited in the Department of Palaeontology, The Natural History Museum, London, by members of the 1990 Niger Republic Expedition, of a male retaining an almost complete right cheliped, and carapaces of three females, not only extends the geographical range, but provide important additions to our knowledge of this species. The stratigraphical and geographical distribution of *Costacopluma* was discussed by Feldmann and Portell (2007).

Systematic palaeontology

Infraorder Brachyura Linnaeus, 1758

Section Eubrachyura Saint Laurent, 1980

Subsection Heterotremata Guinot, 1977

Superfamily Retroplumoidea Gill, 1894

Family Retroplumidae Gill, 1894

Genus *Costacopluma* Collins and Morris, 1975

Type species: *Costacopluma concava* Collins and Morris, 1975, by monotypy.

Range: Campanian to Palaeocene.

Costacopluma concava Collins and Morris, 1975

(Figs. 3.1–6)

1975 *Costacopluma concava* Collins and Morris, p. 823, pl. 97, figs. 1–9.

1983 *Costacopluma concava* Collins and Morris; Gaetani *et al.*, p. 89.

Locality and Stratigraphy: The locality “Igdaman” is well known amongst vertebrate palaeontologists as being the source of abundant fish and reptile remains (Cappetta, 1972; Lingham-Soliar, 1991). The name is a corruption of “In Dama” meaning “The well of the Gazelle” and was inappropriately applied to hill. The actual locality is an isolated hill of early Maastrichtian sediments surrounded by badlands (Figs. 1, 2), 7.5 km east of the village of Kao, 15° 25' 12" N; 005° 47' 36" E.

The material described below was surface-collected by members of the Natural History Museum, London 1990 Niger Expedition, from a discontinuous limestone horizon within the upper part of the Dukamaje Formation. It was given the informal name “Lower *Libycoceras* bed” to distinguish it from a similar horizon, higher in the succession.

Material: Twenty-six Fragmentary carapaces., BMNH IC 501–526.

Description: Cheliped - Judging from comparison of the left and right meri and carpi the chelipedes may be regarded as homochelous.

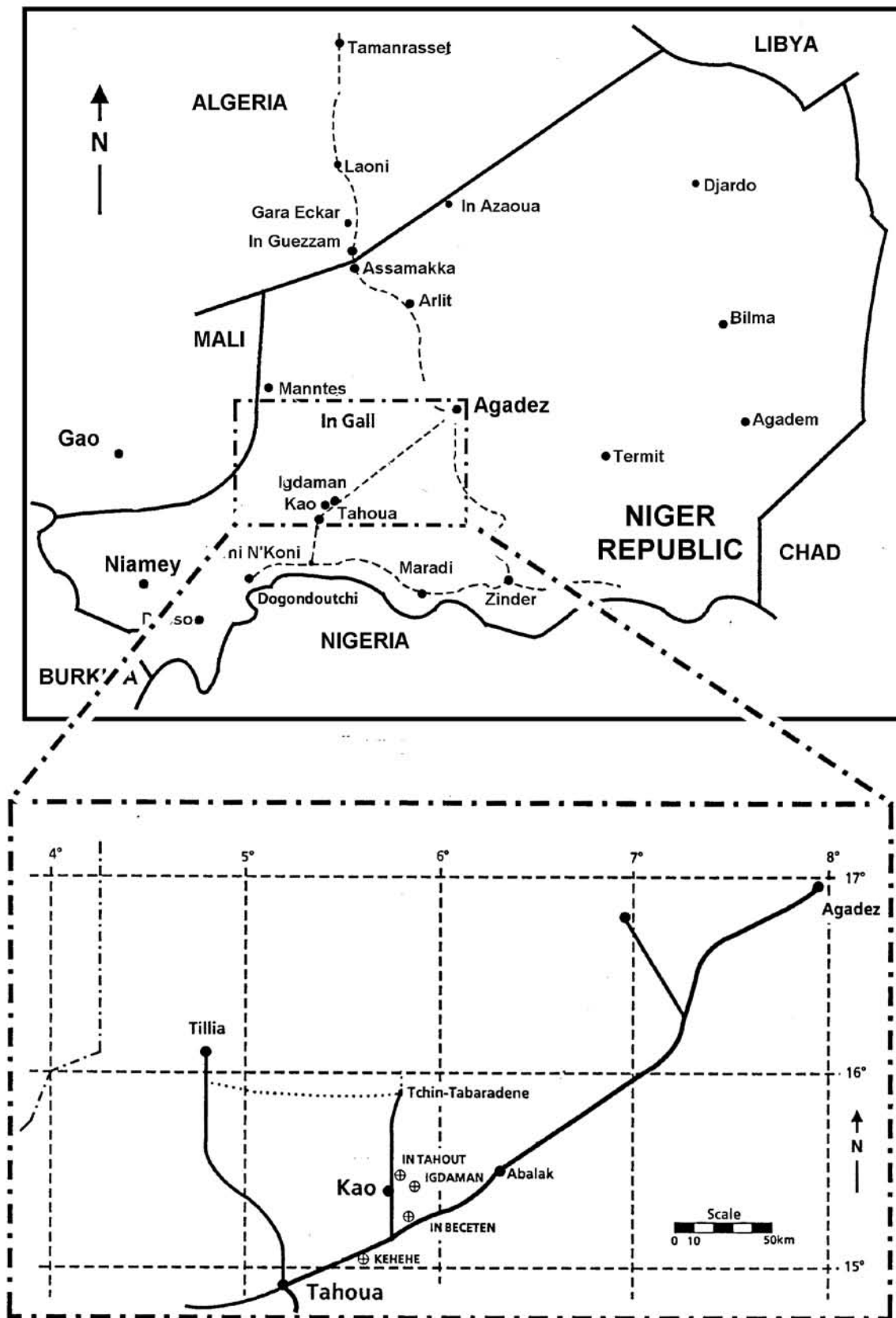


Fig. 1. Map of Niger Republic showing position of Igdaman (In Dama).

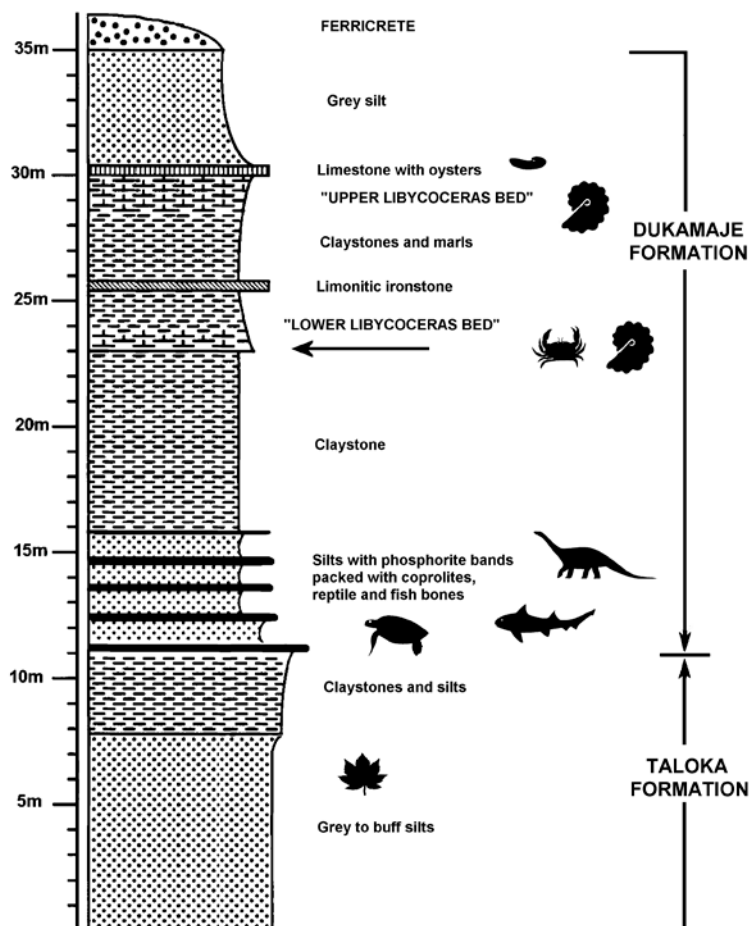


Fig. 2. Section measured at Igdaman, courtesy of Dr Chris King.

Carpus trapezoidal, the length about proximal height, the upper margin tapers distally and a ridge bordering the lower margin terminates in a pit.

Right propodus incurved coincident with the carapace frontal curvature. The manus is robust, the distal height about two thirds of the length; the rounded upper margin about one third the length. Rounded proximally, the lower margin leads into a long, shallow depression before the slightly depressed fixed finger. The carpal margin is oblique to an almost vertical articulation notch, from which a groove runs almost to the dactyl articulation. The interdigital margin is almost vertical and bounded by a shallow groove to the articulation facet, then reclined and weakly concave above. The outer surface is very tumid in its lower proximal half, becoming weakly concave; the inner surface, concave in the upper third, becomes tumid towards the base. The inner and outer surfaces are smooth.

The proximal height of the right (broken) fixed finger is about one third the height of the manus, a rounded median ridge (probably) extends to the tip. The occludent margin has a large, rectangular proximal cusp, then is (apparently) smooth to the tip. A row of setae pits

extends from the dactyl articulation facet along the outer edge of the occludent margin. Fine granules line the basal margin.

The proximal ?third of the right dactylus has an elliptical section and a weakly concave upper margin; three even-sized cusps engage on that of the fixed finger.

Female sternites: A shallow, almost straight furrow separates the 3rd and 4th sternites. Trapezoidal sternites 4 are smooth, the thickened abdominal edge leads to a rounded basi-lateral angle overlapping subrectangular sternites 5 to the extent of the near-basal transverse ridge (Fig. 3.6), then weakly concave to short, stout episternites; sternites 6 and 7 are weakly overlapped and each has a basal transverse ridge.

Extending almost to the 4th/3rd sternal suture, the female abdomen is isosceles triangular in outline. The telson is almost as long as wide with a bluntly rounded apex; somite 6 is wider, a strong median ridge extends laterally to a notch between the 4th/5th sternites – the site of the press button. Somites 3–5 have a transverse ridge. Markedly indented, almost parallel somites 5 and 6 (Collins and Morris, 1975, pl. 9, fig. 4), immediately distinguish the male abdomen. A more completely preserved abdomen among the new material (Fig. 3.4) allows additional observations to the male abdomen described by Collins and Morris (1975): the telson is rather longer than wide; somite 6 has much the same outline as that of the female, while somite 5 is somewhat more quadrate and their margins are

parallel; thereafter, somites 4 and 3 become broadly sub-triangular, the basal margin exceeding twice the width of the apical margin, whereas, in the female it is about one and a half times.

Discussion: Partially exposed associated chelipeds were described for *Costacopluma bifida* Collins *et al.*, 1994; they were considered to be subequal, with the right slightly the larger; the extended length was estimated to be one and a half times the carapace width; extended, the present cheliped would be about one and one sixth times the carapace width. The propodi are similarly strongly curved and the inner surface proximally tumid. The upper surface of the dactylus appears to be finely granulate, whereas that (preserved portion) of *C. concava* is smooth.

The female abdomen is known for *Costacopluma binodosa* Collins and Wienberg Rasmussen, 1992; here, sternites 3 are divided; the abdomen is not fully adpressed so that juxtaposition of the 6th somatic ridge cannot be accurately assessed. The cheliped merus of that species is also granulated on the outer surface.

No sex was attributed to *Costacopluma nordestina* Feldmann and Martens-Neto, 1995, Palaeocene of Brazil, but, by comparison, it would appear to be that of a male.

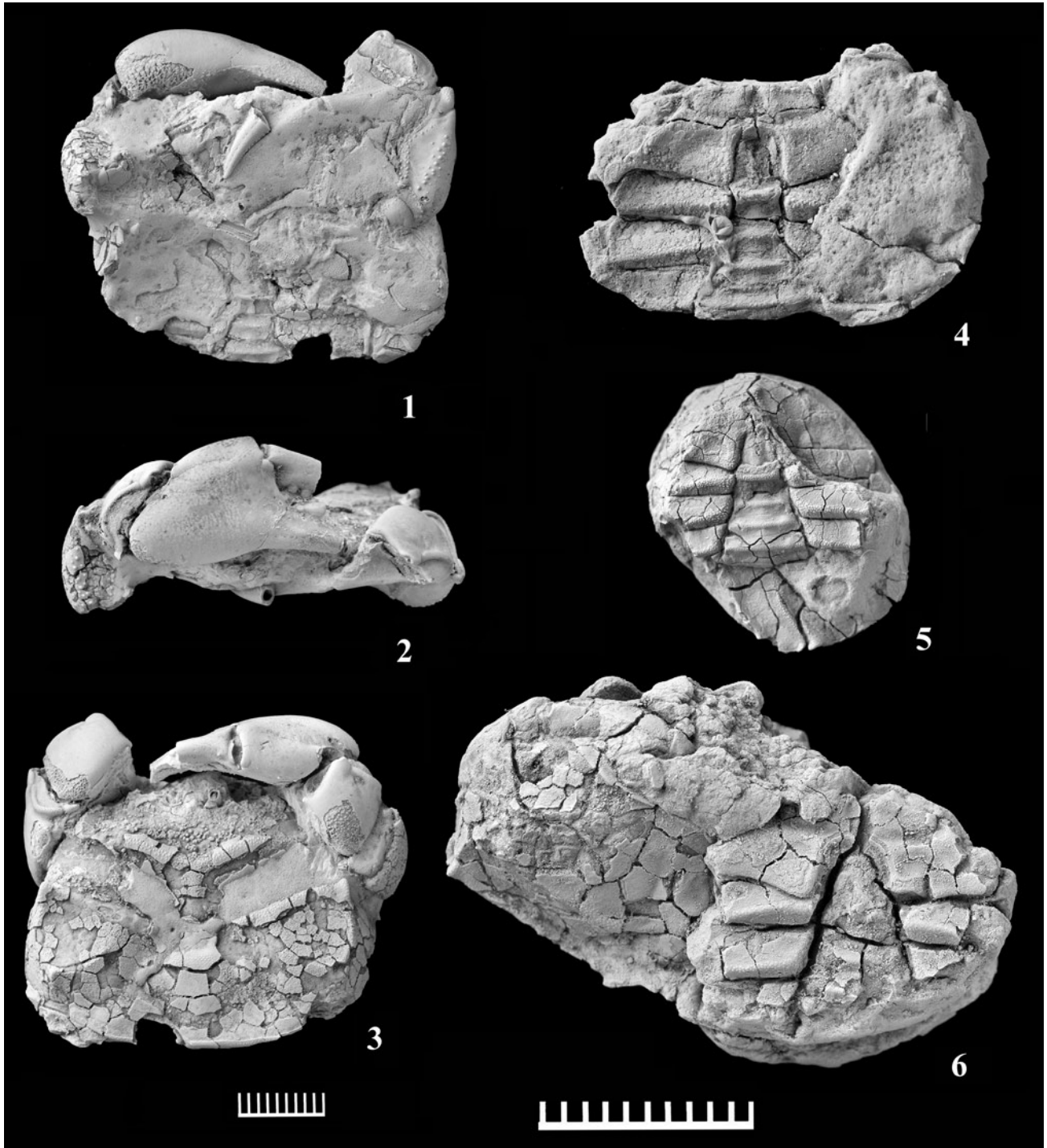


Fig. 3. *Costacopluma concava* Collins and Morris, 1975, from the Early Maastrichtian of the Niger Republic. 1–3. Ventral, frontal and dorsal views of a male carapace with associated right and partial left chelipeds (BMNH) IC 501. 4. Partial sternites and abdomen of a male specimen. (BMNH) IC 502. 5, 6. Partial sternites and abdomina of two female specimens (BMNH) IC 503 and (BMNH) IC 504. Scale bars in mm.

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