

The Larval Development of *Upogebia assisi* Barnard, 1947 (DECAPODA, UPOGEBIIDAE) Reared Under Laboratory Conditions from Ovigerous Female to Postlarvae

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Abstract: The ovigerous females of *Upogebia* (*Upogebia assisi*) were collected from Pacha (24° 50' 54"N , 66° 43' E) on October 6 and 7, 1994 and 1995 respectively. They were kept for rearing under laboratory conditions at room temperature (25-32°C) in the filtered seawater with salinity of 35-36 parts per thousand (ppt) and pH 7.8-9. Development of larvae proceeds from first to three or four zoeal and postlarval stages in the duration of 8-14 days. The larval and postlarval stages of *Upogebia* (*U. assisi*) are described, illustrated and compared with the laboratory reared larval and postlarval stages of *U. quddusiae* by Siddiqui and Tirmizi (1995) from Pakistan and *Upogebia* (*U. kempfi*) n.sp. by Shenoy (1967) from India.

Key Words: Decapoda, Upogebiidae, Larval development, *Upogebia* (*U. assisi*), Pakistan

Introduction

Upogebia (*U.*) *assisi* Barnard, 1947 inhabits yellow silt, which is a semihard substratum found on rocky-cum-sandy shores of Pakistan. This species makes its burrow along with other *Upogebia* species found in Pakistan waters: *Upogebia quddusiae* (Tirmizi and Ghani 1978) ; *Upogebia* (*U.*) *carinicauda* (Stimpson, 1860) [= *U. kempfi* Sankolli 1972 (Sakai, 1982: 35)]; *U. balssi* de Man 1927 (Tirmizi and Kazmi 1983: 366) and *Upogebia* (*U.*) *assisi* is a new record from Pakistan (Kazmi and Bourdon 1997: 59).

No larval study of *Upogebia* (*U.*) *assisi* has been reported. Previously the larvae of *U. quddusiae* have been studied by Siddiqui and Tirmizi, (1995) from

Pakistan; *Upogebia* (*U.*) *kempi* = *carinicauda* by Shenoy (1967) from India; *U. darwini* has been described in detail by Ngoc-Ho (1977) from Thailand and the larvae of *U. edulis* have been studied by Shy and Chan (1996) from Taiwan.

The present study is based on the complete life history of laboratory reared larvae and postlarvae of *Upogebia* (*U.*) *assisi*. The number of zoeal stages varies from 3 to 4 before reaching the postlarval stage. The development is completed within 8-14 days. *Upogebia* (*U.*) *assisi* shows an abbreviated advanced type of development, the zoeae of *U. (U.) assisi* are hatched in a state considerably more advanced than those of their congeneric relatives. The zoeae and postlarval stages are described and illustrated; they are compared with those of the earlier studied larvae and postlarvae *U. quddusia* and *Upogebia* (*U.*) *carinicauda* = *kempi* in Pakistan and India, respectively.

Materials and Methods

Ovigerous females of *Upogebia* (*U.*) *assisi* were collected from Pacha (24° 50' 54''N, 66° 43' E) on October 6, 1994 and October 7, 1995. The specimens were reared under the laboratory conditions (room temperature 25°-32°C, filtered seawater of 35-36‰ salinity). Hatching took place on October 8, 9, 10, 1994 and November 1st, 1995. These larvae were segregated and placed into five glass beakers (500 ml), ten larvae in each beaker, containing stored filtered seawater having the same salinity and temperature as mentioned above. Each beaker was examined daily for exuviae, and dead. Surviving larvae of subsequent developmental stages were transferred to clean beakers filled with freshly filtered stored seawater and fed on newly hatched *Artemia* nauplii. Exuviae and dead larvae were preserved in 5% formalin. Temporary slides were also made by using 5% formalin plus glycerin in a ratio of 1:3 for further study. The larval development was completed within 8-14 days. The specimens were dissected under high magnification (WF 10x4.5) of Ogawa seiki dissecting microscope and illustration were made by using an Olympus BH2 microscope with Nomarski interference contrast and *camera lucida* attachment.

Measurements were made with a stage micrometer on the illustrated specimens. The carapace length (CL) from the tip of the rostrum to the mid-point of the posterior margin of the carapace; total length (TL) was measured from tip of

the rostrum to the mid posterior border of the telson, excluding the telson processes; 'n' refers to the number of individuals measured or dissected. At least 5 specimens of each stage were examined for measurements and setation count, for the 4th stage only 2 specimens were available.

The spent females and larvae are deposited in the Marine Reference Collection and Resource Centre, University of Karachi, under catalogue No: THAL-34 (6.10.94) and THAL-35 (7.10.95).

Results

First zoea

Size-CL = 0.99 - 1.3 mm ; TL = 2.77 - 2.79 mm ; (n = 10), duration 2-3 days

Carapace (Fig. 1A)- Longer than broad ; rostrum long and pointed, reaching along half way length to antennule, tip slightly curved downward. Eyes partially covered by anterolateral margin of carapace.

Abdomen (Fig. 1A)- Six somites, last somite partially fused with telson; protuberance of pleopods present.

Telson (Fig. 1A)- Telson broad, fan-shaped; posterior margin with 7+7 processes on either side of central indentation (hair like processes 2 can hardly observed); anal spine present.

Antennule (Fig. 1B)- Unsegmented with 3 aesthetascs and 3 setae terminally; and a long subterminal seta.

Antenna (Fig. 1C)- Endopod well developed with 3 terminal setae; exopod with 1 strong distolateral spine and 9 marginal setae; protopod with 2 spines distally.

Mandible (Fig. 1D)- Palp absent; incisor and molar processes well developed.

Maxillule (Fig. 1E)- Endopod 3-segmented with 2, 2, 4 setae from proximal to distal segments; basal endite carrying 3 cuspidate and 3 plumodenticulate setae; coxal with 7 plumodenticulate setae.

Maxilla (Fig. 1F)- Endopod with 6 setae; bilobed basal and coxal endites with 8+10 and 10+6 plumodenticulate setae from proximal to distal lobes respectively; exopod (scaphognathite) with 11-12 plumose setae.

First maxilliped (Fig. 1G)- Endopod 5-segmented carrying 2, 2+1, 1+1, 2, 4 plumose setae from proximal to distal segments; basis with 11 and coxa with 2 plumose setae; exopod 2-segmented with 4 natatory setae.

Second maxilliped (Fig. 1H)- Endopod 4-segmented bearing 2, 2, 2, 3+1 plumose setae; basis with 4 setae and coxa without setae; exopod 2-segmented with 4 natatory setae.

Third maxilliped (Fig. 1 I)- Rudimentary, no setation; endopod unsegmented; exopod 2-segmented.

Pereiopods I-III (Figs. 1J-L)- Rudimentary, biramous without setae; endopod 3-segmented; exopod 3-segmented in each pereiopods.

Pereiopods IV and V (Figs. 1M and N)- Rudimentary, uniramous without setation; and with 6-segments.

Second zoea

Size-CL = 1.16 - 1.23 mm ; TL = 2.88 - 2.99 mm ; (n = 10), duration 2-3 days

Carapace (Fig. 2A) - Without a significant change. Eyes more prominent, with short stalk.

Abdomen (Fig. 2A)- Unchanged; rudimentary pleopods present.

Telson (Fig. 2A)- With 8+1+8 processes on posterior margin by the addition of a pair of processes (processes 2 overlap processes 3, difficult to see); and a central spine instead of central indentation; uropodal buds can be seen dorsally under cuticle; annal spine present.

Antennule (Fig. 2B)- Biramous, endopod terminating in a spine and carrying 1-2 subterminal setae; exopod with 3-4 aesthetascs and 3-5 setae; peduncle with 4-5 long plumose setae on their mesial margin; one small seta on lateral margin.

Antenna (Fig. 2C)- Unchanged, except exopod with 14 marginal setae.

Mandibles (Fig. 2D)- Unchanged except appearance of rudimentary palp.

Maxillule (Fig. 2E)- Endopod unchanged; basial and coxal endites with 9 and 10 setae respectively.

Maxilla (Fig. 2F)- Endopod unchanged; basial and coxal endites bilobed carrying 8+9 and 11+6 setae from proximal to distal lobes, respectively; exopod (scaphognathite) with 18 setae.

First maxilliped (Fig. 2G)- Endopod 5-segmented with 2, 2+2, 1+1, 2+1, 4 plumose setae from proximal to distal segments; basis with 11-13 setae and coxa without setae; exopod with 6 natatory setae.

Second maxilliped (Fig. 2H)- Endopod 5-segmented with 2, 3+1, 1, 2, 5 setae; basis with 3 setae and coxa without setae; exopod 2-segmented with 6 natatory setae.

Third maxilliped (Fig. 2I)- Endopod rudimentary; exopod 2-segmented with 7 natatory setae.

Pereiopods I and II (Fig. 2J-K)- Biramous; endopod with partial segmentations, where as endopod of pereiopod III (Fig. 2L) without segmentation; exopod 2-segmented and with 7 natatory setae.

Pereiopods IV and V (Fig. 2M,N)- Uniramous; endopod with partial segmentation.

Third zoea

Size-CL = 1.16 - 1.22 mm ; TL = 2.85 - 2.87 mm ; (n = 6), duration 2-8 days

Carapace (Fig. 3A)- Rostrum slightly decrease in size; carapace and eyes unchanged.

Abdomen (Fig. 3A)- Unchanged, except more developed pleopods (Fig. 3P) on 2-5 abdominal somites 2-5.

Telson (Fig. 3B)- Longer than broad, posterior margin with 8+1+8 processes including 3 pairs of spines on posteriolateral angles, and then largest 4th pair of processes, followed by 5th - 8th pairs of small processes on either side of central small spine; uropods now biramous, exopod with 14-15 marginal plumose setae and a few simple setae; endopod without setae; annal spine present.

Antennule (Fig. 3C)- Endopod unchanged; exopod with 6 aesthetascs and 4 setae; peduncle with 10 long plumose setae (5 distally, 5 on mesial margin) and 4 small plumose setae on lateral margin.

Antenna (Fig. 3D)- Endopod often with 2 terminal setae, with one delicate terminal seta in a few specimens; exopod and protopod unchanged.

Mandibles (Fig. 3E)- Incisor and molar processes unchanged; palp rudimentary.

Maxillule (Fig. 3F)- Unchanged.

Maxilla (Fig. 3G)- Endopod unchanged except exopod (scaphognathite) produced posteriorly, except proximal lobes of basial and coxal endites with 6+1 and 9+1 setae respectively.

First and second maxillipeds (Fig. 3H and I)- Unchanged, except exopod with 7 natatory setae.

Third maxilliped (Fig. 3J)- Endopod rudimentary, partially 2-segmented; exopod, 2-segment with 7 natatory setae.

Pereiopods (Fig. 3K-O)- Unchanged, except more clear segmentation.

Fourth zoea (additional stage)

Size-CL = 1.25 mm ; TL = 2.97 mm ; (n = 2), duration 4-10 days

Carapace- Unchanged.

Abdomen- Unchanged, except more developed pleopod (Fig. 4A).

Telson (Fig. 4B)- Unchanged; uropod also unchanged.

Antennule (Fig. 4C)- Endopod unchanged; exopod with 4 aesthetascs, peduncle with 4 plumose setae on distal end; remaining characters unchanged.

Antenna (Fig. 4D)- Unchanged except endopod segmented, looking like a flagellum.

Mandible (Fig. 4E)- Unchanged, palp absent.

Maxillule, maxilla, first maxilliped and second maxilliped (Fig. 4F-I)- Unchanged.

Third maxilliped (Fig 4J)- Endopod 5-segmented; segments 1 and 3 without setae, whereas segment-2 with 7 setae; segments-4 and 5 with 9 and 19 setae respectively; exopod 2-segmented with 6-7 natatory setae.

Pereiopods 1-V (Fig. 4K-O)- More developed and setose.

First postlarva

Size-CL = 0.92 - 1.10 mm ; TL = 2.39 - 2.76 mm ; (n = 5), preserved within 3 days without mortality.

Carapace (Fig. 5A, Á).- Longer than broad; cervical groove distinct; posterior carapace membranous; anterodorsal surface with a few denticles or spinules and simple setae; dorsolateral surface with bunches of simple setae. Rostrum rounded distally with a few spinules and setae; frontolateral angles with a pair of prongs, lateral margins with 2 spinules on either side; eye-peduncles short and stout, corneae dilated and just reaching to rostrum.

Abdomen (Fig. 5A)- First to fifth somites with large and rounded pleura, fringed with setae; sixth somite simple.

Pleopod (Fig. 6G)- Biramous; endopod smaller than exopod and fringed with plumose setae.

Telson (Fig. 5A and 6A)- Slightly longer than broad; posterior margin with a small median spine and fringed with plumose and simple setae, posteroalateral angles with a pair of spines; dorsal surface bears moderately long simple setae with more setae around anus; uropod shorter than telson; endopod and exopod fringed with plumose and simple setae.

Antennule (Fig. 5B)- Biramous; endopod 2-segmented, distal segment with 3 setae; exopod 3-segmented, bearing 0, 1 aesthetasc 2 setae and 2 aesthetascs 2 setae respectively from proximal to distal segments; peduncle 3-segmented, each segment with a few setae.

Antenna (Fig. 5C)- Flagellum with 14-19-segments provided with small setae; peduncle 3-segmented; segment 2 carrying rudiments of exopod (scaphocerite) with 2 very fine setae.

Maxillule (Fig. 5E)- Endopod partially 2-segmented without setae; basal endite with 7 cuspidate and 8 plumodenticulate setae, and 3 proximal setae; coxal endite with 13-14 setae.

Maxilla (Fig. 5F)- Endopod unsegmented and exceeding to exopod (scaphognathite); carrying one terminal and 3 subterminal setae; basal and coxal endites with several and variable number of setae; exopod (scaphognathite) with 24-26 setae.

First maxilliped (Fig. 5G)- Endopod unsegmented with a single terminal seta; basal endite with several setae; coxa without setae; exopod 3-segmented, bearing 0, 5 and 2 setae from proximal to distal segments.

Second maxilliped (Fig. 5H)- Endopod enlarged and 5-segmented, carrying several setae; exopod reduced and 2-segmented, with 2 terminal setae, basis with 3 setae.

Third maxilliped (Fig. 5I)- Endopod enlarged, 5-segmented thickly setose; exopod reduced; basis and coxa with a few small setae.

Pereiopods (Fig. 6B-F)- Well developed; first pereiopod chelate; inner margin of propodus with few denticles, and inner margin of deactylus with numerous short and long setae; second pereiopod also thickly setose with long setae; third, fourth and fifth pereiopods carrying thin setation with short setae.

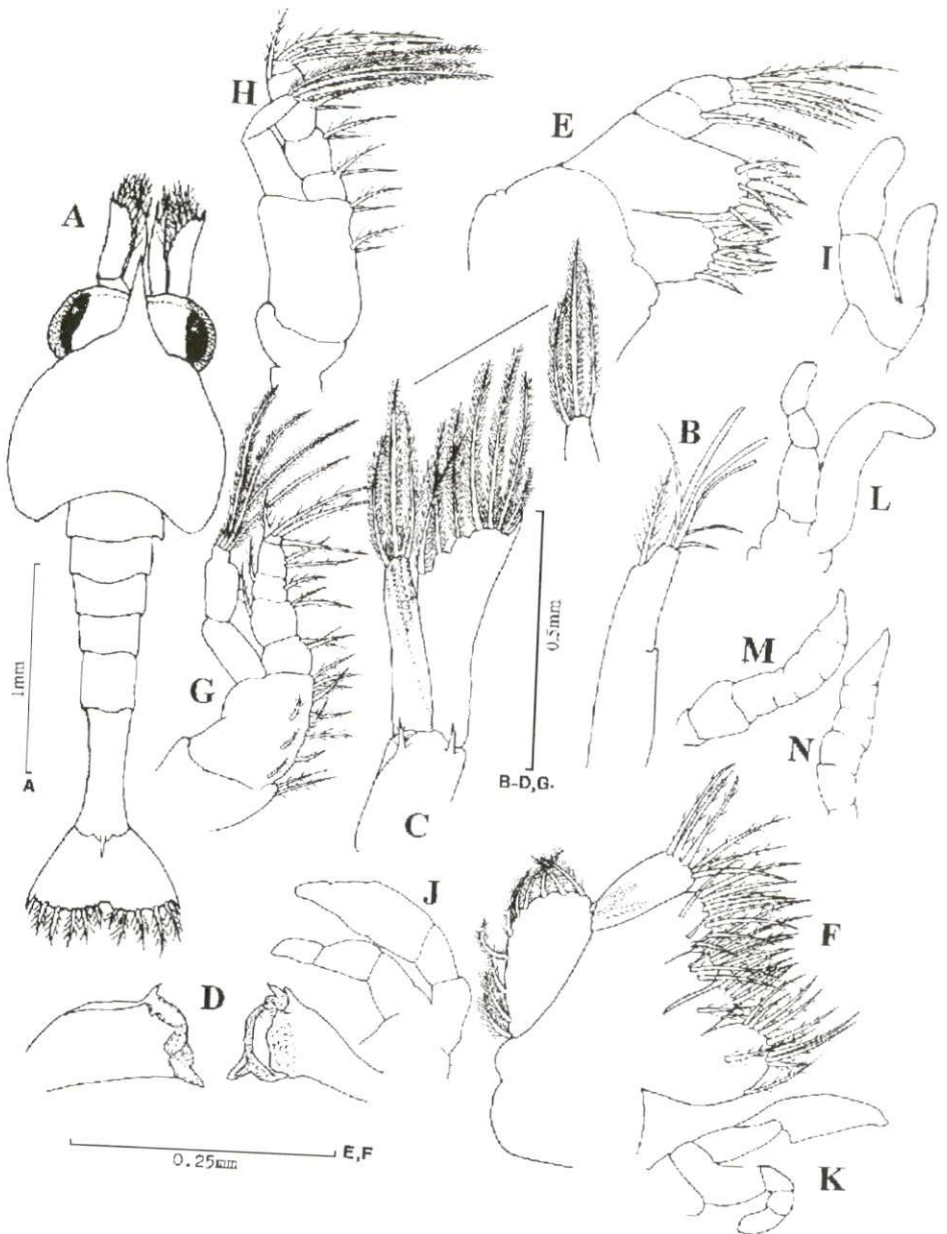


Figure 1: *Upogebia (Upogebia) assisi* Barnard, 1947. Zoea I. A, dorsal view; B, antennule; C, antenna; D, mandibles; E, maxillule; F, maxilla; G-I, maxillipeds I-III; J-N, pereopods I-V.

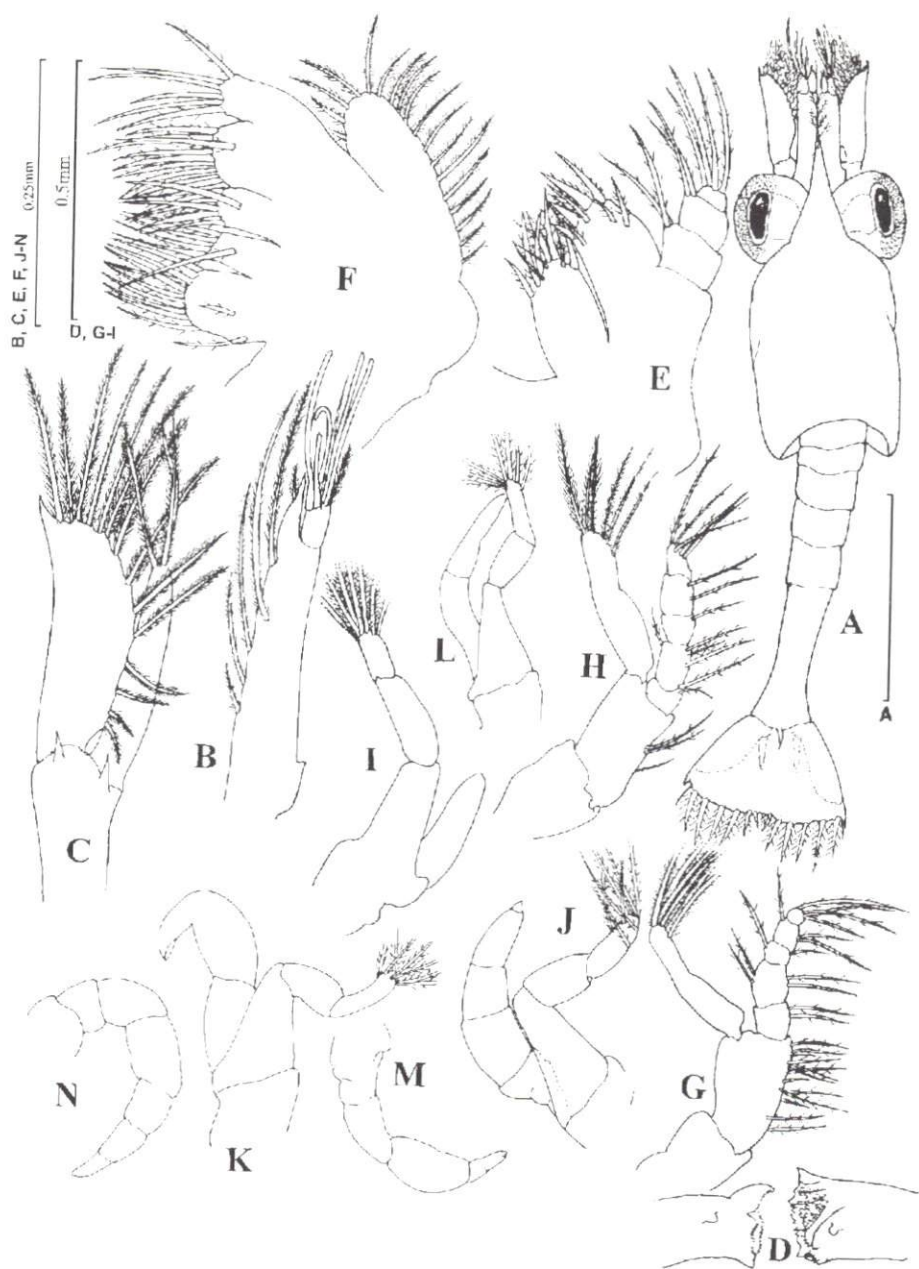


Figure 2: *Upogebia (Upogebia) assisi* Barnard, 1947. Zoea II. A, dorsal view; B, antennule; C, antenna; D, mandibles; E, maxillule; F, maxilla; G-I, maxillipeds I-III; J-N, pereopods I-V.

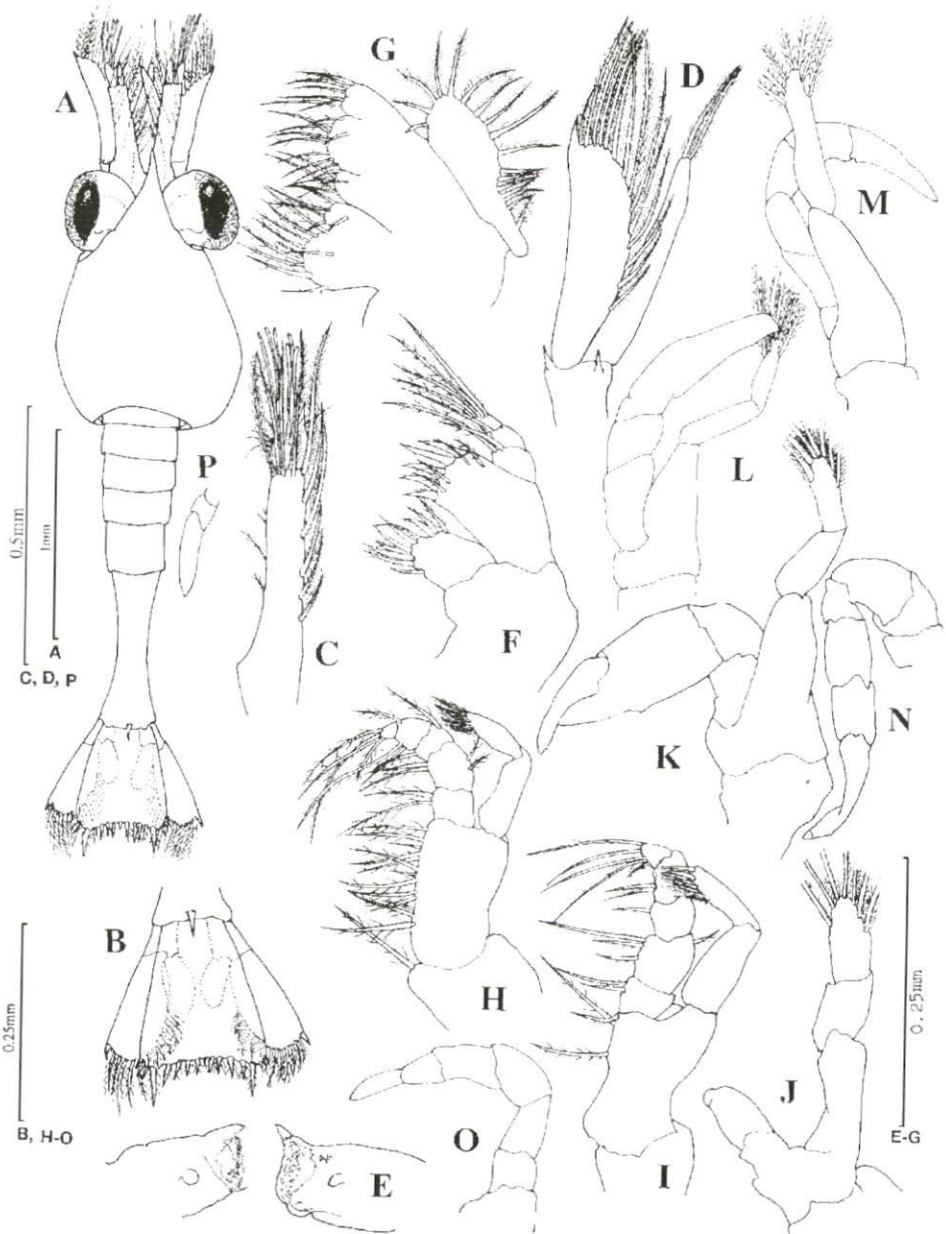


Figure 3: *Upogebia (Upogebia) assisi* Barnard, 1947. Zoea III. A, dorsal view; B, telson, enlarged; C, antennule; D, antenna; E, mandibles; F, maxillule; G, maxilla; H-J, maxillipeds I-III; K-O, pereopods I-V; P, pleopod.

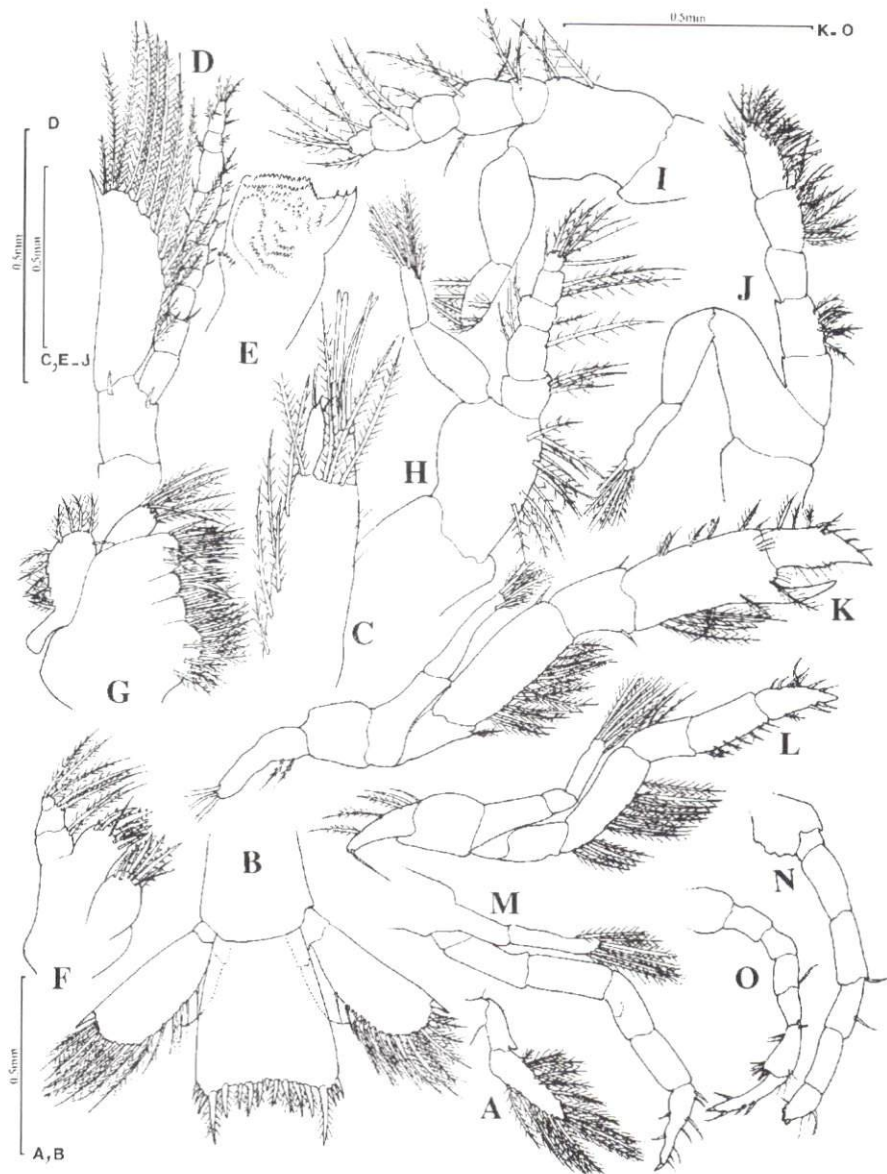


Figure 4: *Upogebia (Upogebia) assisi* Barnard, 1947. Zoea IV (additional stage). A, pleopod; B, telson; C, antennule; D, antenna; E, mandible; F, maxillule; G, maxilla; H-J, maxillipeds I-III; K-O, pereopods I-V.

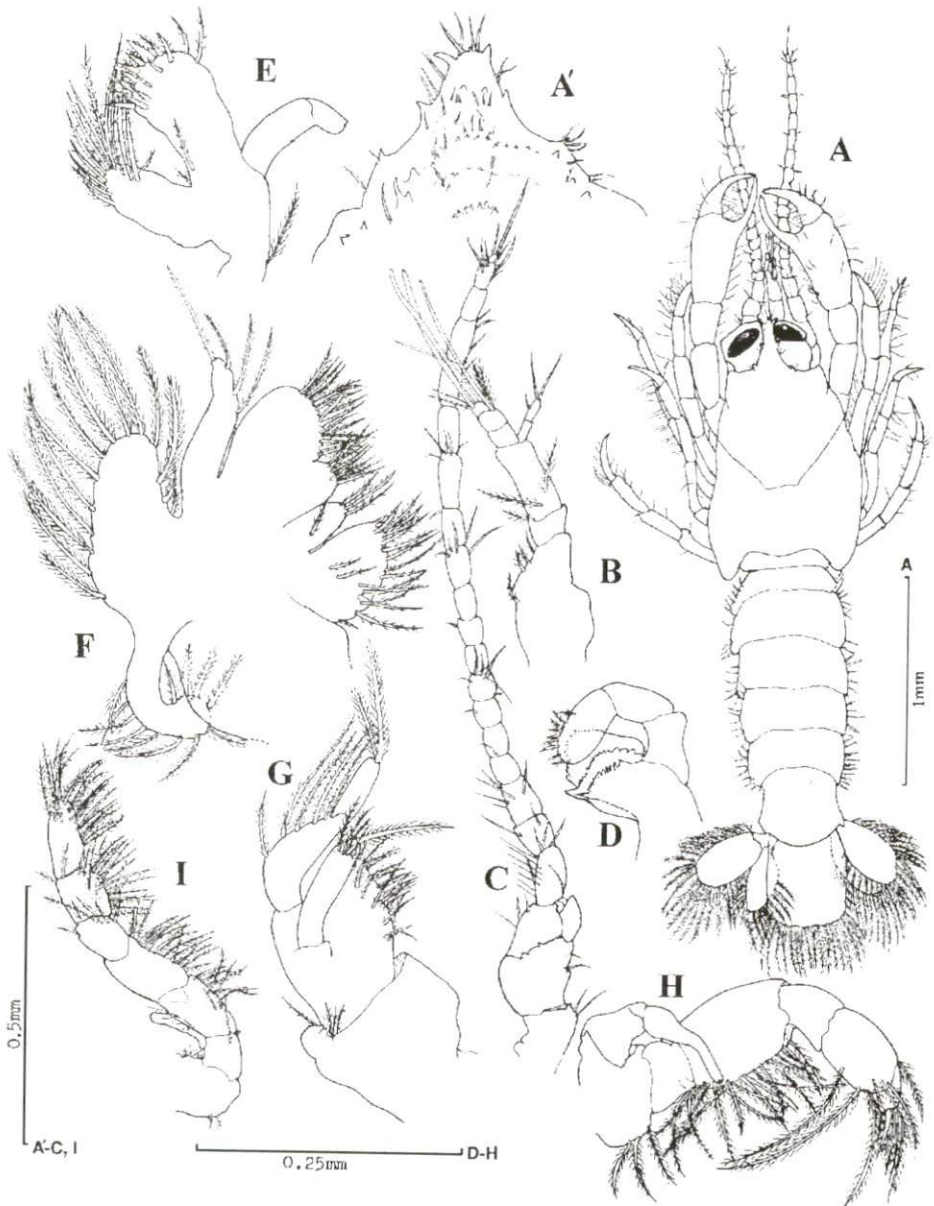


Figure 5: *Upogebia (Upogebia) assisi* Barnard, 1947. First postlarva. A, dorsal view; A', distal part of carapace showing rostrum; B, antennule; C, antenna; D, mandible; E, maxillule; F, maxilla; G-I, maxillipeds I-III.

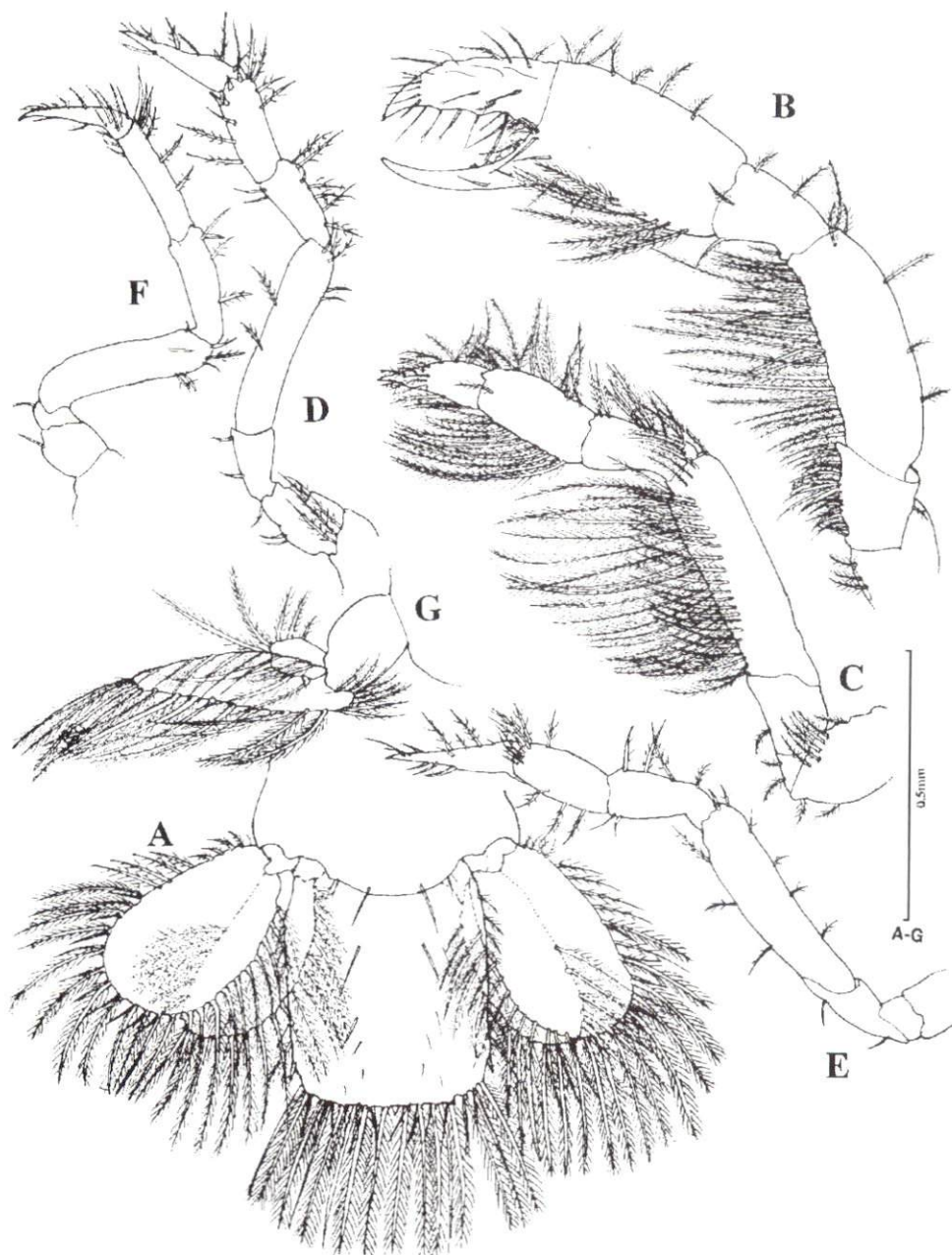


Figure 6: *Upogebia (Upogebia) assisi* Barnard, 1947. First postlarva. A, telson dorsal view, enlarged; B-F, pereopods I-V; G, pleopod.

Discussion

The larval development of *Upogebia* (*U.*) *assisi* Barnard, 1947 proceeds from the first to the third or fourth zoeal stages and then to postlarval stage, which shows that *Upogebia* (*U.*) *assisi* has an abbreviated advanced type of development. Rabalais and Gore (1985) have reported that "The Thalassinidea display a wide range of developmental sequences". In most upogebiids the regular zoeal stages are first to four or five, which is followed by the postlarvae (Webb 1919, Sandifer 1973, Rodrigues 1976, and Ngoc-Ho 1977). In the case of *Upogebia* D.I (Gurney 1938) zoea I was as advanced as the last stage IV of *U. deltaura* and probably moulted into postlarvae, as it was observed in *U. savignyi* by Gurney 1937. *Upogebia quddusiae* studied by Siddiqui and Tirmizi 1995, also passes through an abbreviated advanced type of development.

The general appearance of the postlarvae of *Upogebia* (*U.*) *assisi* and *U. quddusiae* show a great similarity in the chelate first pereopod and the squarish shape of the telson. By contrast, *Upogebia* (*U.*) *carinicauda* = *kempi* shows many differences in their characters of the zoeae and also in the postlarvae as the subchelate first right pereopod, and the telson having a median shallow notch armed with a median tooth on its posterior margin.

The differentiating characters between the larvae (I-III) and postlarvae of the three species of *Upogebia*: *U.* (*U.*) *assisi*; *U. quddusiae* and *U.* (*U.*) *carinicauda* = *kempi* are summarised in table 1.

Table 1. Comparison between morphological characters of zoea I to III and postlarvae of *Upogebia* (*U.*) *assisi*; *Upogebia quddusiae* and *Upogebia* (*U.*) *carinicauda* = *kempi*.

Zoea I			
Characters	<i>Upogebia</i> (<i>U.</i>) <i>assisi</i>	<i>U. quddusiae</i>	<i>Upogebia</i> (<i>U.</i>) <i>carinicauda</i> = <i>kempi</i>
Antennule:			
Aesthetascs	3	3	3
Terminal + subterminal			
Setae	4(3+1)	5(4+1)	4(3+1)
Peduncle	-	-	-
Lateral margin	-	-	-
Mesial margin	-	-	-
Distal end exopod	-	-	-
Endopod:	Absent	absent	Absent
Antenna setae:			
Endopod	3	3	3
Exopod	9	9	9
Maxillule setae:			
Endopod	8(2, 2, 4)	8(2, 2, 4)	6(1, 2, 3)
Basal endite	6(3+3)	6(3+3)	6
Coxal endite	7	6+1	8
Maxilla setae:			
Endopod	6(3+3)	6(3+3)	6(3+2+1)
Basal endite	18(5+3, 7+3)	15(5+1, 7-8+1)	5, 6
Coxal endite	16(9+1, 4+2)	18(10+2, 5+1)	8, 4
Exopod	11-12	9-12	5
Maxilliped I setae:			
Endopod	13(2, 2+1, 1+1, 2, 4)	15(3, 2+1, 1+1, 2+1, 4)	12(2, 2, 1, 2, 5)
Basis	11(8+3)	12(9+3)	9
Exopod	4	4	4
Maxilliped II setae:			
Endopod	10(2, 2, 2, 3+1)	14(2-3, 3, 2-3+1, 4)	9(2, 2, 1, 4)
Basis	4(2+2)	3	3(2+1)
Exopod	4	4	4
Maxilliped III:			
Endopod	rudimentary	rudimentary	rudimentary
Exopod	-	-	1
	-	-	Few setae mesially

Table 1 continued :

Zoea II			
Characters	<i>Upogebia (U.) assisi</i>	<i>U. quddusiae</i>	<i>Upogebia (U.) carinicauda = kempi</i>
Antennule:			
Aesthetascs	3-4	4	4
Terminal + subterminal			
Setae	3-5	4	3
Peduncle setae			
Lateral margin	1	3	1
Mesial margin	4-5	5	4
Endopod:	Spinate, with 1-2 setae	spinate, with 2 setae	Spinate, without setae
Antenna setae:			
Endopod	3	3	3
Exopod	14	13	11
Maxillule setae:			
Endopod	8(2, 2, 4)	8(2, 1+1, 4)	8(2, 2, 4)
Basal endite	9(5+4)	10(6+4)	6
Coxal endite	10(6+4)	8(7+1)	8
Maxilla setae:			
Endopod	6(3+3)	6(3+3)	6(3+3)
Basal endite	17(6-7+1, 8+1)	14(6+1, 7)	19
Coxal endite	17(9+2-10+1, 5+1)	13(6-8, 5)	18
Exopod	18	8-12	10
Maxilliped I setae:			
Endopod	15(2, 2+2, 1+1, 2+1, 4)	15(3, 2+1, 1+1+2+1, 4)	12(2, 2, 1, 2, 5)
Basis	11-14	12	9
Exopod	6	6	5-6
Maxilliped II setae:			
Endopod	12(2, 2, 1, 2, 5)	17(2-3+1, 3+1, 1, 2+1, 4+1)	12(2, 2, 3, 4+1)
Basis	3	3	2
Exopod	6	6	5-6
Maxilliped III:			
	rudimentary	rudimentary	rudimentary
Endopod	-	-	1
Exopod setae	7	6	5

Table 1 continued:

Zoea III			
Characters	<i>Upogebia (U.) assisi</i>	<i>U. quddusiae</i>	<i>Upogebia (U.) carinicauda</i> = <i>kempi</i>
Antennule:			
Aesthetascs	6	4	4
Treminal setae	4	4	2
Peduncle setae	-	-	-
Lateral	4	3	2
Mesial + distal	5+5	5+5	5+3
Endopod:			
Treminal setae	2	2	2
Treminal spine	present	present	absent
Antenna:			
Endopod	without segment 1-2 setae	2-segmented, terminal spine 1 seta	without segment terminal spine 1 seta
Peduncle setae	-	-	-
Exopod	14-15	14-15	12
Maxillule setae:			
Endopod	8(2, 2, 4)	8(2, 2, 4)	8(2, 2, 4)
Basal endite	9(5+4)	9(5+4)	9
Coxal endite	10	10(9+1)	9
Maxilla setae:			
Endopod	6(3+3)	6(3+3)	6(3+3)
Basal endite	16(6+1, 8+1)	17(6+2, 8+1)	19
Coxal endite	16(9+1, 5+1)	16(9, 4-6+1)	18
Exopod	17	10-14	10
Maxilliped I setae:			
Endopod	15(2, 2+2, 1+1, 2+1, 4)	16(2-3, 2+2, 1+1, 2+1, 4)	11(1, 2, 1, 2, 5)
Basis	14	11-14	8
Exopod	7	6	5
Maxilliped II setae:			
Endopod	13(2, 3+1, 1, 2, 5)	17(2, 3+1, 1, 2+2, 5-6)	12(2, 2, 3, 5)
Basis	3	3	3
Exopod	7	6	5-6
Maxilliped III:			
Endopod	rudimentary	rudimentary	rudimentary
Exopod setae	7	6	6

Table 1 continued:

Characters	Postlarvae		
	<i>Upogebia (U.) assisi</i>	<i>U. quddusiae</i>	<i>Upogebia (U.) carinicauda = kempi</i>
Antennule:			
Aesthetascs	3	3	4
Terminal setae	2+2	2	2+2
Peduncle setae	3-segmented, few setae	3-segmented, few setae	4-segmented:
Lateral	7(4, 1, 2)	12(4+3, 3, 2)	Bunch of setae 1, 2, 1
Mesial + distal	-	-	1-long
Endopod	2-segmented	2-segmented	Unsegmented
Terminal setae	3	3	4
Terminal spine	absent	absent	Absent
Antenna:			
Endopod	14-19-segmented flagellum with setae, few specimen without flagellum	12-16-segmented flagellum, few specimen without flagellum	5-segmented flagellum
Peduncle setae	3-segmented, few setae	4-segmented, few setae	4-segmented: 10(0, 2, 3, 2+3)
Exopod	reduced, 2 setae	reduced, single seta	leaf like with 8 setae
Maxillule setae:			
Endopod setae	nil	nil	8(2, 2, 4)
Basial endite	18	several setae and spine	13(4, 4, 5)
Coxal endite	13-14	10-1	8
Maxilla setae:			
Endopod	1+3	2	5
Basial endite	thickly setose	thickly setose	15
Coxal endite	"	"	14
Exopod	24-26(14+12)	24-26	27-28
Maxilliped I setae:			
Endopod	1	styliform with 6 setae	11(3, 2, 1, 2, 3)
Basis	several	thickly setose	16(4+10-12)
Exopod	7(0, 5, 2)	14(1, 8+1, 4)	7(0, 3, 4)
Maxilliped II setae:			
Endopod	5-segmented thickly setose	5-segmented with numerous setae	5-segmented 17(3, 3, 2, 3+1, 4+1)
Basis	3	1	-
Exopod	reduced with 2 setae	1, 2	7
Maxilliped III:			
Endopod	rudimentary thickly setose	rudimentary thickly setose	rudimentary 2, 2, 2, several, 7
Basis	1	1	-
Exopod	reduced, no setae	reduced, 2, 1+2	1, 6

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