J. mar. biol. Ass. India, 1970, **12** (1 & 2): 64-80

AMPHIPODS OF THE FAMILY AMPITHOIDAE FROM THE MADRAS COAST

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INTRODUCTION

THE amphipod family Ampithoidae has been extensively dealt with by Barnard, J. L. (1965 a & b, 1969 b & c, 1970). The family now comprises nine genera (excluding *Pleonexes* Bate now made a subgenus) which together with the number of species known are as follows : 1 species of *Amphithoides* Kossmann, 1 species of *Amphitholina* Ruffo, 41 species of *Ampithoe* Leach, 5 species of *Ampithoe* (*Pleonexes*), 10 species of *Cymadusa* Savigny, 1 species of *Exampithoe* K. H. Barnard, 1 species of *Macropisthopus* K. H. Barnard, 1 species of *Paradusa* Ruffo, 1 species of *Paragrubia* Chevreux, and 2 species of *Sunamphitoe* Bate. These data have been compiled from Barnard, J. L. (1958, 1969 c, 1970), Schickel (1968) and Ruffo (1969).

From Indian seas, four species of Ampithoidae have been reported so far. *Ampithoe ramondi* Audouin was recorded by Walker (1904, 1905), Barnard, K. H. (1935) and Sivaprakasam (1970), *Cymadusa filosa* Savigny by Walker (1905) and Sivaprakasam (1970) as *Grubia microphthalma* Chevreux, *Cymadusa sardenta* (Oliveira) by Sivaprakasam (1970) and *Paragrubia vorax* Chevreux by Walker (1905). Giles' (1888) record of *Amphithoe indica* M.-Edw. was synonymised with *A. ramondi* by Barnard, K. H. (1935, 1937) and with *C. filosa* by Pirlot (1939), though its correct identity is still doubtful. Nayar's (1959) record of *A. inda* has now been found to Chevreux be identical with *A. alluaudi* Chevreux.

In the present paper, two new species of *Ampithoe*, *A. cavimana* sp. nov. and *A. platycera* sp. nov. and three new records, *A. falsa* K. H. Barnard, *A. alluaudi* Chevreux and *A. kulafi* J. L. Barnard are described and figured.

Ruffo (1969) has shown that the correct spelling of the genus is *Amphithoe*, though the present spelling is followed on account of wider and longer use in the amphipod literature.

The author is thankful to the Director, Zoological Survey of India for providing laboratory facilities and to Dr. J. L. Barnard, U.S. National Museum, Dr. S. Ruffo, Museo Civico di Storia Naturale di Verona and Dr. D. E. Hurley, New Zealand Oceanographic Institute, for sending valuable literature on the subject.

Suborder Gammaridea

Family Ampithoidae

Genus *Ampithoe* Leach

Ampithoe cavimana sp. nov.

(Fig. 1)

Material : Gulf of Mannar : Several examples of males and females from sea-weeds at Hare island, Tuticorin. 4 males and 3 females from Kilakkarai. 1 male from Nallatanni island. 3 males and 1 female from Pamban. Length upto 7.5 mm.

Types : Male holotype, female allotype and a male paratype collected from Kilakkarai, have been deposited in the Zoological Survey of India, Calcutta.

Description : Male : Body smooth. Head with lateral lobes quadrate with rounded corners. Eyes oval and colourless in alcohol. Epimeral plates with a little tooth at posterolateral corner and hind margin rounded.

Antenna 1 more than half the body length. Peduncle with 1st joint stout and as long as 2nd. 3rd joint short. Flagellum twice as long as peduncle, with about 30 joints. Antenna 2 slender, reaches middle of flagellum of antenna 1. 4th joint of peduncle $1\frac{1}{4}$ as long as 5th. Flagellum as long as peduncle, with about 18 joints.

Upper lip rounded below. Lower lip with inner lobes well-developed. Outer lobe widely and shallowly cleft, outer half with beaklike process. Mandible with primary cutting plate 7-dentate and the accessory 4-dentate. Spine row with 6 spines. Molar well-developed. 3rd joint of palp longer than 2nd, distally with long setae. Maxilla 1, inner plate with 3 setae. Outer plate with 10 spines. 2nd joint of palp with 6 apical spines and 4 setae on lower surface. Maxilla 2, inner plate setose on inner and apical margins. Outer plate apically setose. Maxilliped, inner plate reaches beyond 1st joint of palp, inner and apical margins with stout setae. Outer plate reaches beyond 2nd joint of palp, inner margin with about 13 curved spines, increasing in length towards apex. 4th joint of palp tipped by a spine.

Gnathopod 1 with side plate produced forwards. 2nd joint distally lobed in front. 3rd joint slightly lobed. 4th joint acutely produced distally. 5th joint $1\frac{1}{4}$ times as long as 6th, hind margin long and lamellar, with setiferous notches and distally produced. 6th joint oblong-oval, narrow at base. Hind margin straight and setose. Palm oblique, with short setae, with a flat-topped prominence near hinge of dactylus followed by a shallow concavity, palmar angle prominent with a stout spine. Dactylus serrate and overlapping palm. Gnathopod 2 large and stout. Side plate oblong. 2nd and 3rd joints lobed in front. 4th joint produced below hind lobe of 5th which has brushlike setae. 6th joint large and oblong, $1\frac{1}{2}$ times as long as 5th and also its own width. Palm oblique, with a flat-topped prominence near hinge of dactylus, followed by a deep and widening concavity, which with hind margin forms defining tooth. Palm and hind margin with long and fine setae. Dactylus short and stout, serrate and acute-tipped.

In large males, gnathopod 1 becomes very long and palmar concavity deeper. Gnathopod 2 is large. Flat-topped tooth becomes separated from hinge of dactylus

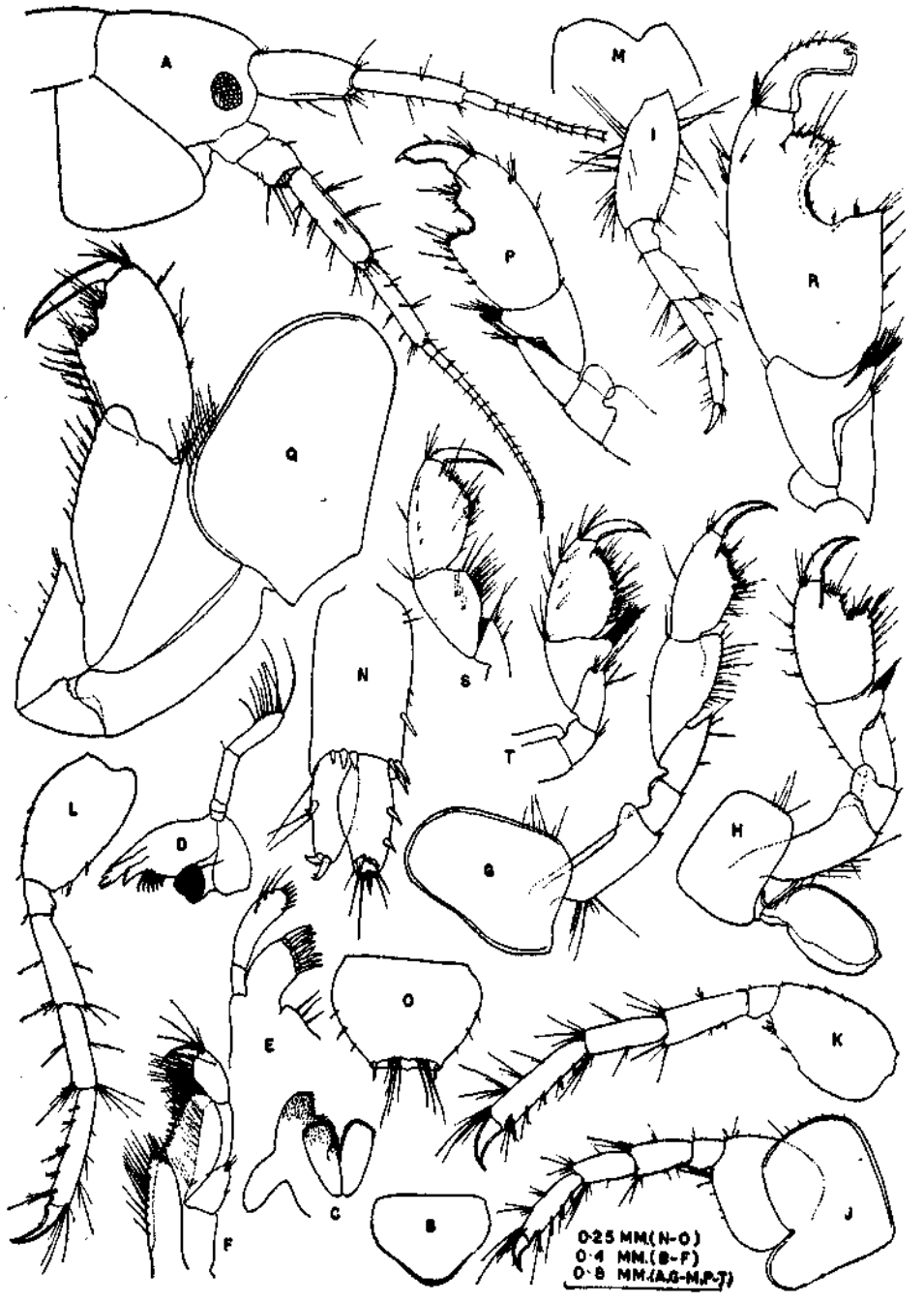

FIG. 1. *Ampithoe cavimana* sp. nov. Male : A. head with antennae ; B, C, upper and lower lips ; D. mandible ; E. maxilla 1 ; F. maxilliped ; G, H. gnathopods 1, 2 of specimen 6.0 mm. in length ; I, J, K, L. peraeopods 1, 3, 4, 5; M. epimeral plate 3; N. uropod 3 ; O. telson ; P. gnathopod 2 of specimen 7.0 mm. in length ; Q, R. gnathopods 1, 2 of specimen 7.5 mm. in length. Female : S, T. gnathopods 1, 2.

by a shallow gap with the usual curved spine, and acute-angled posteriorly. The palmar concavity becomes very large, deeply and widely rounded like a diagonal U. Dactylus develops an angular prominence near the acute tip and finally becomes abruptly truncate, with the pointed tip lying over blunt end, separated by a narrow space.

Peraeopods 1 and 2 alike but the former is a little longer. Side plate oblong. 2nd joint stout but not very wide. 4th joint not widened. 5th and 6th joints slender. Dactylus nearly straight. Peraeopod 3 with side plate large and hind lobe small. 2nd joint as long as broad, widest near base and narrowing distally. 6th joint with 4 long spines on hind margin. Dactylus stout and curved. Peraeopods 4-5 alike but the latter is longer. 2nd joint oblong, narrowing distally, front margin more convex and distal part of hind margin with 2 spines. 4th joint longer than 5th. 6th joint not widened, with 5 stout spines on front margin. Dactylus long and curved.

Uropods very spinous. Uropod 1, peduncle with a long distal spine, longer than inner ramus which is longer than the outer. Uropod 2, peduncle as long as inner ramus which is longer than the outer. Uropod 3 extends a little beyond others. Peduncle stout, less than twice as long as rami, with spines on distal margin. Rami elongate. Inner ramus a trifle longer, inner margin with two spines and distally with 3 spines, a few spinules and setae. Outer ramus with a spine on outer margin and distally with the two usual uncinate spines.

Telson as usual, broader than long and narrowing distally. Lateral angles with a stout seta and between them 4 long setae on each side. Lateral margin with 3 setules.

Female : Similar to the male except in the gnathopods. Gnathopod 1 with 6th joint longer than 5th. Palm oblique, slightly and uniformly convex and defined by a pair of spines. Gnathopod 2 with 3rd joint not lobed in front. 5th joint triangular, cup-shaped, $\frac{2}{3}$ as long as and broader than 6th. Hind lobe with usual brushlike setae. 6th joint oblong-oval. Palm shorter than hind margin, oblique, slightly convex and defined by a spine. Dactylus stout, serrate and acute-tipped.

Remarks : A. cavimana sp. nov. derives its specific name from the deeply excavate palm of male gnathopod 2. The 3rd epimeral plate with a point at posterolateral corner and male gnathopod 1 with 5th joint $1\frac{1}{4}$ times as long as 6th, at once separate the new species from all others except *A. tarasovi* Bulycheva in which 5th joint is 1.8 times as long as 6th (see Barnard, J. L.'s key, 1965a). However, the new species is somewhat similar to the young male of *A. pollex* Kunkel (1910) (Barnard, J. L., 1954, 1965a) in the 2nd gnathopod, but in the latter species the side plates are shallower, gnathopod 1 has 5th joint shorter than 6th, the palm oblique and straight, gnathopod 2 has no lobes on 2nd joint, palm without flat-topped tooth but deeply cleft fissure. From *A. ramondi* Audouin (Shoemaker, 1933 as *A. divisura*, Barnard, J. L., 1965a, 1970), the new species is separated by the slender antenna 2, male gnathopod 1 with elongate 5th joint and oblique, concave palm and male gnathopod 2 with 6th joint sparsely setose, without anterodistal lobe overhanging base of dactylus and palm widely and obliquely excavate and not cleft like fissure.

The new species can be distinguished from other known species of the genus by a combination of the following characters : (1) the long and slender antennae ; (2) male gnathopod 1 with 5th joint $1\frac{1}{4}$ times as long as 6th and palm slightly ex-

cavate ; (3) male gnathopod 2 with wide, oblique cavity and dactylus abruptly truncate in the adult ; (4) peraeopods 4-5 with 2 spines on hind margin of 2nd joint ; and (5) epimeral plates with a little tooth at posterolateral corner.

Ampithoe platycera sp. nov.

(Fig. 2)

Material : Gulf of Mannar : 11 males from seaweeds on coral reefs at Appa island. Length upto 5.0 mm.

Types : Male holotype and 5 male paratypes have been deposited in the Zoological Survey of India, Calcutta.

Description : Male : Head with lateral lobe quadrate, anterior corner a little produced. Eyes oval and dark. Body smooth with dark pigmentation which extends over appendages also. Epimeral plates with posterolateral corner rounded.

Antenna 1 about 3/5 as long as body and slender. Peduncle with 1st joint stouter and longer than 2nd. 3rd joint short. Flagellum twice as long as peduncle, with about 16 joints. Antenna 2 stouter and more setose. Peduncle with joints 2-4 strongly compressed and markedly wide. 4th joint as long as and twice as wide as 5th. Flagellum slender, about twice as long as last peduncular joint and with about 12 joints.

Upper lip broadly rounded. Lower lip with outer lobe deeply cleft and outer half with a pointed lobule. Inner lobe and mandibular process well-developed. Mandible with primary cutting plate 5-dentate and the accessory 6-dentate. Spine row with 5 spines. Molar stout with a plumose seta. Palp stout, 1st joint short, 2nd joint subequal to 3rd which has 5 long setae at apex. Maxilla 1, inner plate with 3 setae on inner margin. Outer plate with 10 spines. 2nd joint of palp with 6 spines at apex and 4 setae on lower surface. Maxilla 2 with outer plate broader than inner, both setose on apical and inner margins. Maxilliped with inner plate not reaching end of 1st joint of palp, inner and apical margin with plumose setae. Outer plate not reaching end of 2nd joint of palp, spines on inner margin increasing in length towards apex. Last joint of palp tipped by a spine.

Gnathopod 1 stout and sparsely setose. Side plate conically produced towards front corner. 2nd joint stout and lobed in front distally. 3rd joint also lobed in front. 4th joint wide and conically produced distally. 5th joint triangular, as wide as and $\frac{3}{4}$ as long as 6th, front margin straight with a spinule and hind lobe upturned with a few setae. 6th joint oblong, width more than half its length, with a few long setae on hind margin and palm. Palm $\frac{1}{4}$ as long as hind margin, oblique with a narrow flat-topped part near hinge of dactylus, followed by a widely concave part which joins hind margin at right angle and with a stout spine at this angle. Dactylus somewhat falcate, serrate and overlapping palm. Gnathopod 2 larger and stout. Side plate quadrate-rounded. 2nd joint stout with a large distal lobe on front margin. 3rd joint slightly lobed. 4th joint stout, distally setose. 5th joint triangular, $\frac{2}{3}$ as long and wide as 6th, front margin straight with 2 spinules and hind lobe blunt with setae. 6th joint large, strongly widening distally, $\frac{2}{3}$ as long as wide. Front margin produced into widely conical lobe beyond hinge of dactylus, the whole margin with 10 sets of long and dense setae which are as long as the joint. Hind

margin straight with short setae. Palm oblique and sinuous, with short setae, a flat-topped part near hinge of dactylus followed by a shallow concave part, palmar end right-angled with a stout spine. Dactylus takes a middle position because of overhanging lobe, stout, serrate and as long as palm.

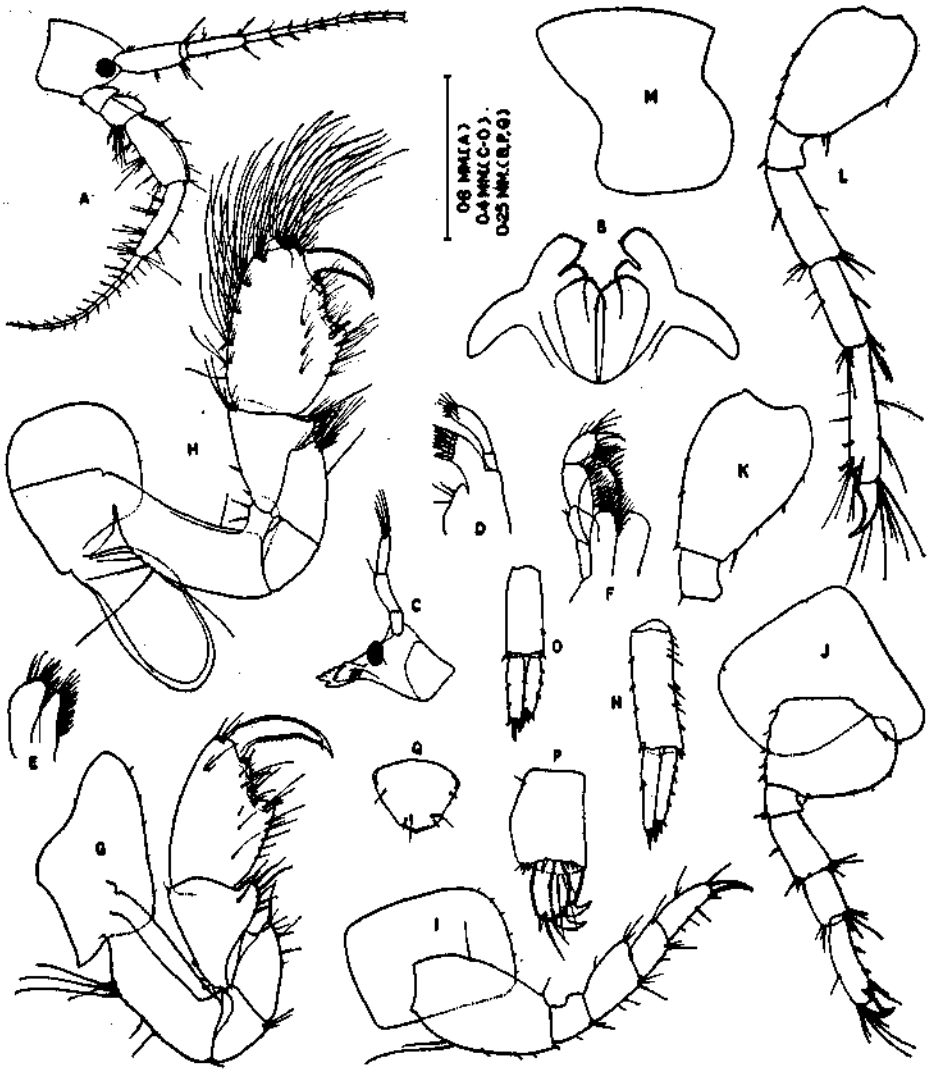

FIG. 2. *Ampithoe platycera* sp. nov. Male: A. head with antennae; B. lower lip; C. mandible; D, E. maxillae 1, 2; F. maxilliped; G, H. gnathopods 1, 2; I, J, K, L. peraeopods 1, 3, 4, 5; M. epimeral plate 3; N, O, P. uropods 1, 2, 3; Q. telson.

Peraeopods 1 and 2 alike. Side plate oblong. 2nd joint very wide. 4th joint widening distally. 5th joint short and 6th narrowing distally. Dactylus slightly curved. Peraeopod 3 with side plate large and its hind lobe small. 2nd joint

trapezoid, front margin drawn angularly in the middle and hind margin rounded near the base. Joints 3-5 stout. 6th joint with 3 spines and 2 distal ones on hind margin. Dactylus stout and curved. Peraeopod 4 with 2nd joint oblong-oval, widest near the base. 6th joint with 2 distal spines and 2 others above on front margin. Peraeopod 5 similar but much longer.

Uropods spinous, 3rd extending a little beyond others. Uropod 1 with peduncle stout, 5/3 as long as outer ramus which is shorter than inner. Uropod 2 with peduncle a little longer than inner ramus which is longer than outer. Uropod 3 with peduncle markedly short and stout, distally bearing spines. Inner ramus distally with 3 spines and 2 setae. Outer ramus with two stout uncinate spines as usual and outer margin finely serrulate.

Telson narrowing distally, with a seta on lateral margin and a pair of stout unequal setae above lateral angle.

Female : Not known.

Remarks : A. platycera sp. nov. which derives its specific name from the flattened (compressed) peduncle of antenna 2, appears at first sight to resemble *A. waialua* J. L. Barnard (1970) in the male gnathopods 1-2 and the peraeopods, but a close scrutiny reveals the following differences. In the new species, gnathopod 1 has coxa strongly produced anteriorly, 6th joint much broader, palmar concavity shallow and without a defining cusp and the defining spine is at palmar angle and not proximal to it. Gnathopod 2 has 5th joint with 2 spines on front margin, 6th joint much broader, front margin more convex and produced anterodistally so that dactylus is middle-positioned as in *A. ramondi* Audouin, palm less oblique, slightly excavate and shorter than hind margin, without a defining cusp but with a defining spine. Peraeopod 3 has front margin of 2nd joint strongly conical and distally with 5 setiferous notches. 2nd joint of peraeopods 4-5 are more linear. Peduncle of antenna 2 is dilated and strongly compressed. Lower lip has inner lobe of outer plate distinct and not coalesced with inner plate. 3rd joint of mandibular palp is setose at apex only and inner margin naked. Maxillae and maxilliped of *A. waialua* are not described or figured for comparison.

A. platycera also resembles *A. simulans* Alderman (1936), well-illustrated by Barnard, J. L. (1965a), in the form of 2nd gnathopods, but in the latter species 2nd antennae are not compressed, gnathopod 1 is densely setose and palm not excavate, gnathopod 2 has 6th joint not produced anterodistally, palm longer than hind margin, very oblique and defined by a cusp, peraeopod 3 has oblong 2nd joint and peraeopods 4-5 have more spines on 6th joint.

A. platycera is closest to *A. ramondi* Audouin (Barnard, J. L., 1965a, 1970) in gnathopod 2 having front margin produced anterodistally and densely setose and the dactylus in central position, but in the latter species peduncle of antenna 2 is not compressed, spines on outer plate of maxilliped are serrated, gnathopod 1 has palm rounded and gnathopod 2 has palm deeply cleft.

In Barnard's (1965a) key to the species of *Ampithoe, A. platycera* keys to couplet 28 in which it can be separated by the male gnathopod 2 with 6th joint $\frac{2}{3}$ as long as wide and the flagellum of antenna 1 more than twice as long as flagellum of antenna 2.

Barnard's (1969a, p. 190, figs. 7 o-p) record of *A. ramondi* is questionable though he says it is atypical of this species and may indicate subspeciation. It resembles *A. platycera* in the gnathopod 1 with excavate palm but the coxa is not strongly produced, and gnathopod 2 with 6th joint anterodistally produced and dactylus middle-positioned but palmar excavation is deeper and there is a distinct cusp.

Ampithoe falsa K. H. Barnard

(Figs. 3-4)

Ampithoe falsa Barnard, K. H., 1932, p. 240 ; 1937, p. 170, fig. 16 ; 1940, p. 480.

Amphithoe falsa Ruffo, 1969, p. 57, figs. 18-20.
Schickel, 1969, p. 330, pls. 6-7.

Ampithoe brevipes Barnard, K. H., 1916, p. 255, pl. 28, fig. 34 (*non* Dana).

Material : Gulf of Mannar : 3 females from seaweeds at Nallatanni island. 3 females from Appa island. 2 females from Kilakkarai. 2 females from Pamban. Length upto 6.5 mm.

Description : Female : Head with lateral lobes subquadrate. Eyes oval and colourless in alcohol. Body smooth. Epimeral plates with posterolateral corner quadrate-rounded.

Antenna 1 half as long as body. 1st joint of peduncle stout, a little longer than 2nd. Flagellum 2½ times as long as peduncle, with about 20 joints. Antenna 2 reaches middle of flagellum of antenna 1. Flagellum as long as peduncular joints 4-5 and with about 12 joints.

Upper lip with 2 circlets of setae below, separated in the middle. Lower lip with outer lobe deeply notched, inner half larger than outer. Inner lobes well-developed. Mandibular process tapering. Mandible with primary cutting plate 8-dentate and the accessory 6-dentate. Spine row with 10 spines. Molar small. 3rd joint of palp shorter than 2nd, apically with 4 stout setae. Maxilla 1 with one seta on inner plate. Outer plate with 10 spines. 2nd joint of palp narrow, with 3 spines apically. Maxilla 2 as usual. Maxilliped with plumose setae on inner and apical margins of inner plate. Outer plate with serrate spines on inner margin. 2nd joint of palp rather wide and last joint tipped by a spine.

Gnathopod 1 with side plate oblong, rounded below and not produced. 2nd joint long and stout and not lobed in front. 5th joint shorter than 6th, hind margin densely setose. 6th joint oblong, 2½ times as long as broad, both margins setose. Palm narrow, transverse and defined by two small spines. Dactylus rather stout and overlapping palm. Gnathopod 2 very much alike but a little stouter. 5th joint much shorter than 6th, hind lobe rounded and setose. 6th joint oblong, twice as long as broad, otherwise similar to gnathopod 1.

Peraeopods 1 and 2 alike. 2nd joint remarkably wide, front margin more convex. 4th joint widened and produced anterodistally. 5th and 6th joints slender. Dactylus blunt-tipped. Peraeopods 3-5 markedly stout and increasing in length. Peraeopod 3 with side plate large as usual. 2nd joint rounded, tapering distally.

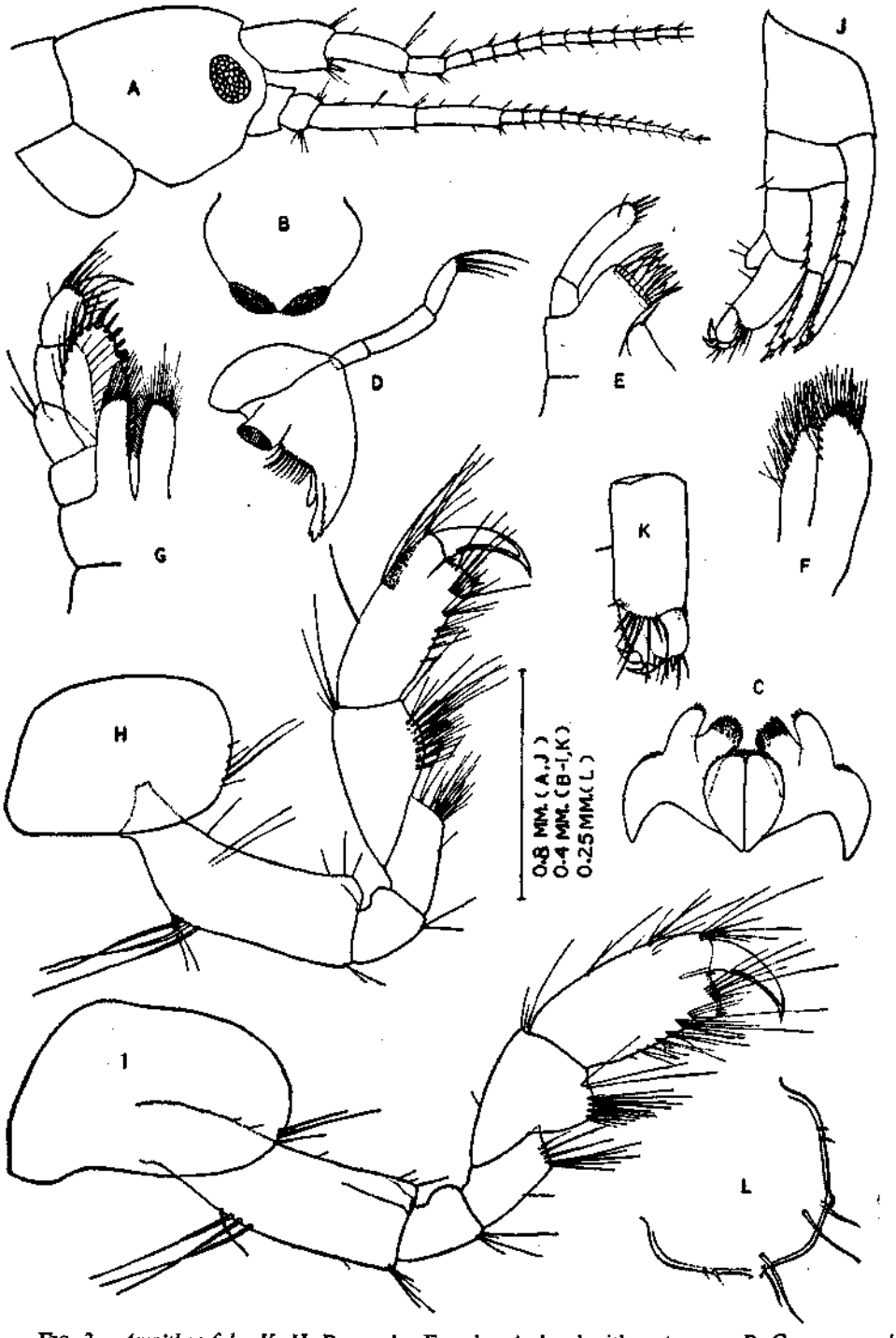

FIG. 3. *Ampithoe falsa* K. H. Barnard. Female : A. head with antennae ; B, C. upper and lower lips ; D. mandible ; E, F. maxillae 1, 2 ; G. maxilliped ; H, I. gnathopods 1, 2 ; U. urus; K. uropod 3 ; L. telson.

Joints 4-5 short and stout. 6th joint with 4 sets of spines on hind margin. Dactylus short and curved. Peraeopod 4 intermediate in stoutness and length. Peraeopod 5 with 2nd joint oblong-oval. Joints 4-5 long and stout. 6th joint with spines reduced and replaced by setae.

Uropods spinous, 3rd extending a little beyond others. Uropod 1 with peduncle 1½ times as long as inner ramus and with a small distal process. Outer ramus ⅔ as long as inner. Uropod 2 with peduncle shorter than inner ramus which is longer than outer. Uropod 3 with peduncle twice as long as rami. Inner ramus with a spine and setae apically. Outer ramus with 2 usual uncinate spines and outer margin minutely serrulate.

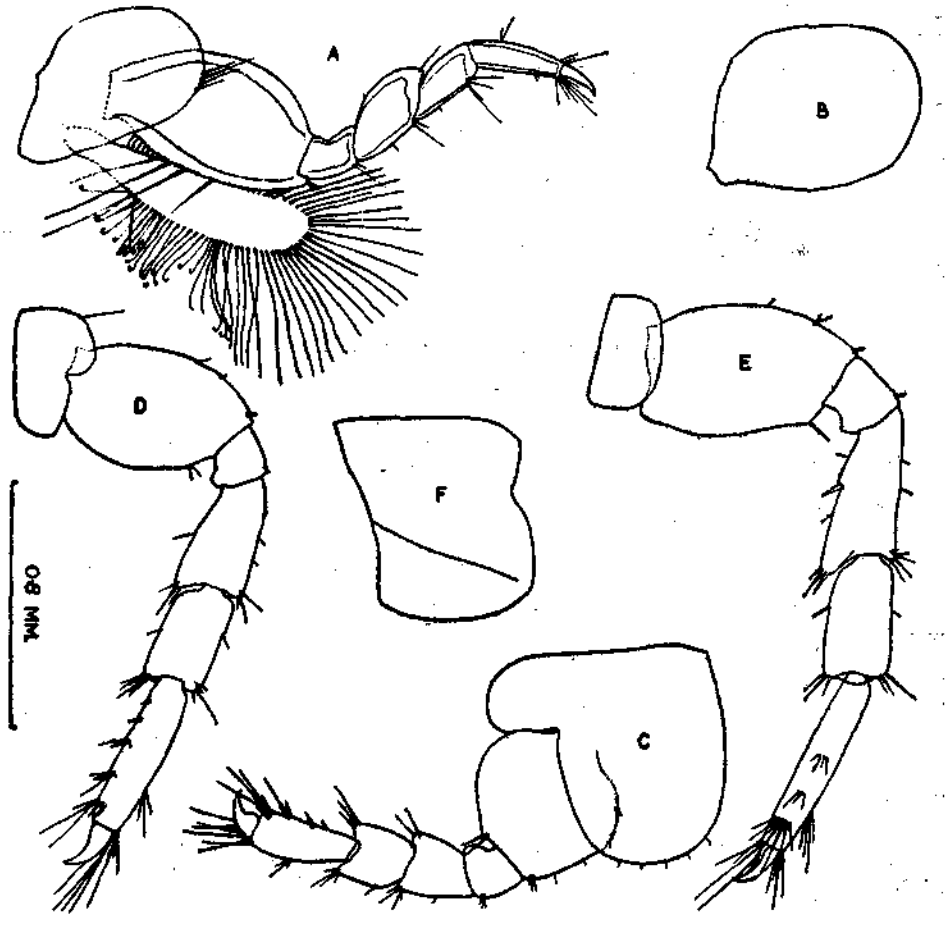

FIG. 4. *Ampithoe falsa* K. H. Barnard. Female: A. peraeopod 1; B. peraeopod 2, side plate; C, D, E. peraeopods 3, 4, 5; F. epimeral plate 3.

Telson widest near the base and tapering towards lateral angles which are cornified. Lateral margin with 2 short setæ and above lateral angle a pair of long setæ.

Male : Not represented in the present material, but as described in detail by Ruffo (1969).

Remarks : Although males are not found in the present material, the females closely agree with Barnard's and Ruffo's description and figures, particularly in the slender mandibular palp, gnathopods with 6th joint oblong and palm transverse, 2nd joint without anterodistal lobe, peræopod 1 and 2 with very wide 2nd joint, distally produced 4th joint and peraeopods 3-5 with joints 4-5 very stout, particularly in peræopod 3.

Ruffo (1969) has recently recorded this species from the Red Sea, but female gnathopods 1 and 2 have the 6th joint stout and not linear as figured here and by Barnard (1937). Peræopods 3-5 are also much more stouter than figured here. Schickel (1969) has also reported this species from the Adriatic Sea.

The female gnathopods with 6th joint oblong and palm transverse are known in a number of species including *A. eoa* Bruggen, *A. femorata* Kroyer, *A. brevipes* Dana, *A. orientalis* Dana etc., but *A. falsa* can be separated from them by the slender antennæ, the form of the upper lip, the 2nd joint of gnathopods without anterodistal lobes and the wide 4th and 5th joints of posterior peræopods.

Distribution : South Africa, Central Arabian Sea, Gulf of Aden, Red Sea and Adriatic Sea in the Mediterranean. This is the first record of this species from India.

Ampithoe alluaudi Chevreux

(Fig. 5)

Amphithoe Alluaudi Chevreux, 1901, p. 418, figs. 40-45.

Ampithoe alluaudi Stebbing, 1906, p. 738.

Ampithoe inda Nayar, 1959, p. 36, pl. 13, figs. 1-11 (*non* Milne-Edw.).

Material : Gulf of Mannar : 3 males and 2 females from seaweeds at Kilakkarai. 2 females from Appa island. Several examples of males and females from Pamban. Madras coast : 2 males and 3 females from seaweeds at Kovelong. 3 females and 3 males from algæ at Madras harbour. Length upto 6.0 mm.

Description : Male : Head with lateral lobes quadrate-rounded. Eyes oval and dark. Body smooth with dark pigmentation which extends to appendages also. Epimeral plates with posterolateral corner rounded.

Antenna 1 half as long as body. Peduncle very short, about $\frac{1}{4}$ as long as flagellum. 1st joint stout and longer than 2nd. 3rd joint very short. Flagellum with about 32 joints and bearing sensory filaments. Antenna 2 reaches middle of flagellum of antenna 1. 4th joint of peduncle longer than 5th, both together with proximal part of flagellum with short, dense setæ on lower margin. Flagellum twice as long as peduncle and with about 20 joints.

Upper lip broadly rounded. Lower lip with outer lobe deeply incised, outer half with a beaklike lobule. Inner lobes well-developed. Mandible with body large,

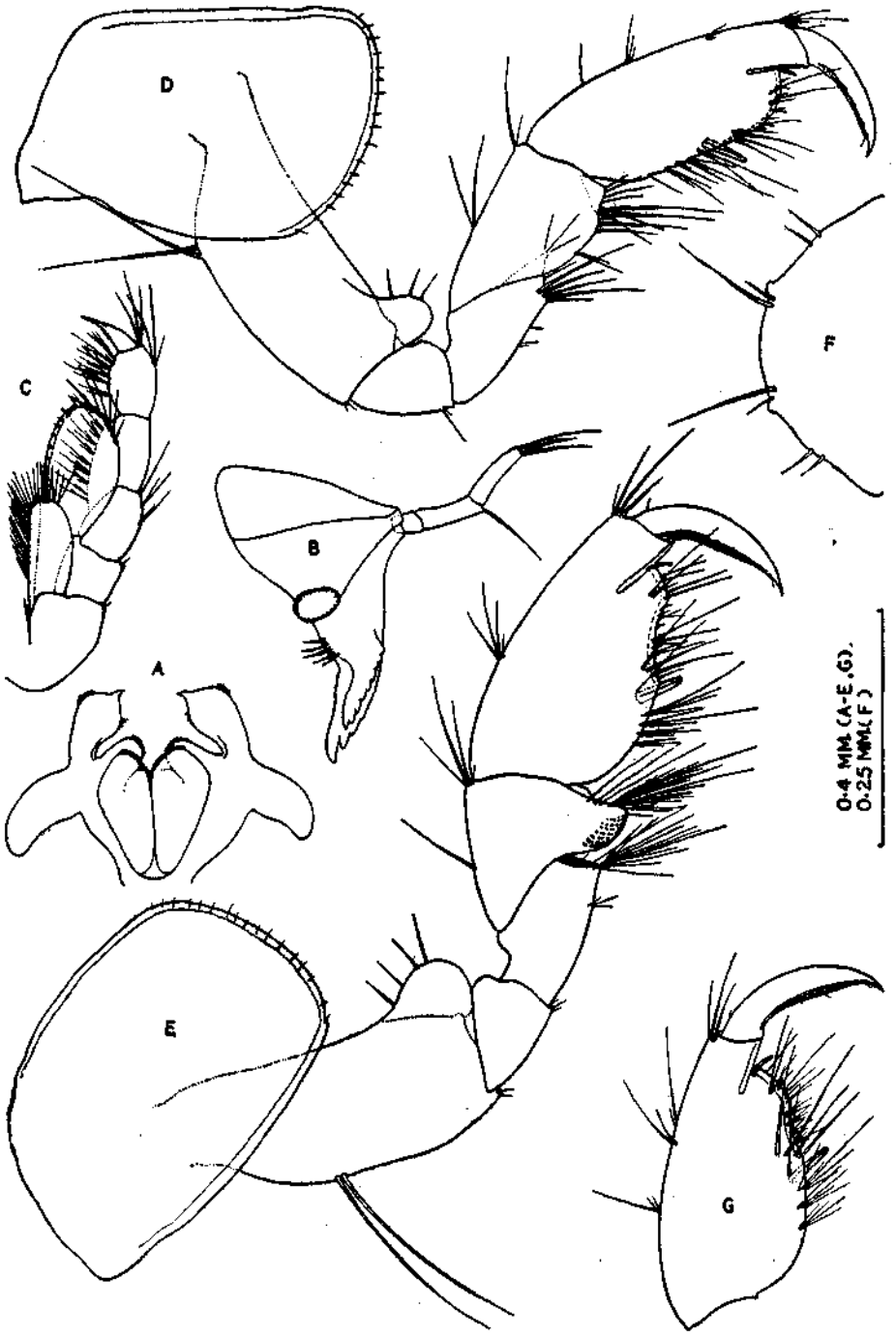

FIG. 5. *Ampithoe alluaudi* Chevreux. Male : A. lower lip ; B. mandible ; C. maxilliped ; D, E. gnathopods 1, 2 ; F. telson. Female : G. gnathopod 2.

Primary cutting plate 9-dentate and the accessory 8-dentate. Spine row with 5 spines. Molar oval. Palp slender, 2nd joint a trifle longer than 3rd and apically with a long seta and 3rd joint with 3 long apical setæ. Maxilla 1, inner plate with a seta. Outer plate with 10 spines. 2nd joint of palp with 6 apical spines and 6 setae. Maxilla 2 as usual. Maxilliped with inner plate setose on inner and apical margins. Outer plate reaching end of 2nd joint of palp, spines on inner margin very much reduced and submarginal. Palp stout and as usual.

Gnathopod 1 with side plate oblong, not produced. 2nd joint stout, with anterodistal lobe. 5th joint 5/8 as long as 6th, hind margin rounded and setose. 6th joint oblong, palm narrow, transverse, palmar corner rounded and continuous with hind margin. Hind margin with a stout spine at $\frac{2}{3}$ its length. Dactylus coarse on inner margin and overlapping palm. Gnathopod 2 slightly larger. Side plate to 4th joint as in gnathopod 1. 5th joint triangular and cuplike, half as long as 6th and wider, hind lobe rounded below and apex with long setæ. 6th joint large, oval, widest near the base. Palm very oblique, with flat-topped part near hinge of dactylus and the rest concave and with a stout spine near palmar angle. Dactylus with coarse inner margin.

Peraeopods 1 and 2 alike and subequal. 2nd joint stout but not very wide, setose. 4th joint not widened, 5th short and 6th slender and without spines. Dactylus blunt-tipped. Peræopods 3-5 increasing in length (4th longer than 5th in some specimens) and without spines except at distal end of 6th joint which is slightly widened distally. Peræopod 3 with side plate large and hind lobe small. 2nd joint rounded, hind margin produced into rounded lobe distally. 4th and 5th joints short and stout, with long setæ on hind margin, 6th joint distally widened, with 3 stout spines of which the innermost is curved and a spinule at dactyl hinge, thus forming oblique, incipient palm. Dactylus stout and curved. Peræopod 4 with 2nd joint oblong-quadrate hind margin rounded near the base and distally. Joints 4-5 rather broad. 6th joint as in peræopod 3. Peræopod 5 longer, slenderer and setose. 2nd joint elongate-oval, narrowing distally.

Uropods spinous, 1st and 2nd with peduncle longer than rami and outer ramus shorter than inner. Uropod 3 with peduncle more than twice as long as rami. Outer ramus with two usual uncinate spines.

Telson broader than long, narrowing distally, with 2-3 setæ on lateral margin, a short seta at the cornified lateral corner and a long seta medial to it.

Female : Similar and almost indistinguishable from male except by the ribbon-like incubatory lamellæ. Gnathopod 2 has palm less concave and almost continuous with hind margin.

Remarks : The present material closely agrees with Chevreux's description and figures. Nayar's (1959) record of *A. inda* is synonymous with this species.

Chevreux (1901) pointed out the intermediate position of this species between the genera *Ampithoe* and *Pleonexes* Bate in the distally expanded 6th joint of peræopods 3-5, but this character has now been found in many species of *Ampithoe*. Barnard, J. L. (1970) has therefore made *Pleonexes* a subgenus of *Ampithoe*, distinguished only by the hooked telson.

Distribution : Seychelles islands. This is the first record of this species from India.

Ampithoe kulafi J. L. Barnard

(Fig. 6)

Pleonexes (?) species J. L. Barnard, 1965b, p. 542, fig. 34.

Ampithoe kulafi J. L. Barnard, 1970, p. 50.

Material : Gulf of Mannar : 3 males and 6 females from seaweeds on coral reefs at Appa island. Length upto 5.0 mm.

Description : Male : Head with lateral lobes quadrate-rounded. Eyes oval and dark. Body smooth with a pair of setules on urosome segments 1 and 2. Epimeral plates with posterolateral corner quadrate-rounded.

Antenna 1 more than half the body length and much longer than antenna 2. Peduncle with 1st joint stout and longer than 2nd. 3rd joint half as long as 2nd. Flagellum 2½ times as long as peduncle, with about 20 joints, each with a pair of sensory filaments. Antenna 2 with 4th joint of peduncle longer than 5th. Flagellum longer than peduncle, with 16-17 joints.

Upper lip semicircular. Lower lip with outer lobe deeply cleft, outer half projecting and with a beaklike lobule. Inner lobe and mandibular process well-developed. Mandible with primary cutting plate 8-dentate and the accessory 6-dentate. Spine row with 4 spines. Molar stout, with a seta. Palp short and slender, 3rd joint subequal to 2nd and with 2 apical setæ. Maxilla 1, inner plate with a seta. Outer plate with 10 serrate spines. 2nd joint of palp with 6 apical spines and 2 setae. Maxilla 2 as usual in the genus. Maxilliped with inner plate not reaching to end of 1st joint of palp, with plumose setæ on inner and apical margins. Outer plate reaches a little beyond 2nd joint of palp, spines on inner margin very much reduced and submarginal. Palp stout, last joint tipped by a spine.

Gnathopod 1 with side plate deep and conically produced anteriorly. 2nd joint long and lobed anterodistally. 5th joint ¾ as long as 6th, hind lobe rounded with a few setæ. 6th joint elongate-oval, twice as long as broad, hind margin continuous with the very oblique palm, together more convex than front margin and with short, sparse setae. Palm demarcated from hind margin by a short spine. Dactylus slender and matching palm. Gnathopod 2 very large. Side plate oblong, rounded below. 2nd joint long and slender, with a lamellar lobe on front starting from the base and widening distally. 5th joint very short and cuplike. 6th joint very large, widest in the middle near palmar angle. Front margin convex and setose. Palm longer than hind margin, oblique, setose, slightly convex in the middle and flattened between two margins. Palmar angle prominent. Dactylus stout, long, strongly arched and fitting palm.

Peræopods 1 and 2 alike. Side plate oblong. 2nd joint stout but not very wide. 4th joint slightly widening distally. 5th and 6th joints short. Dactylus slender and curved near the tip. Peræopods 3-5 increasing in length, joints not widened, 6th widened distally and with 3 spines to form a palm. Peræopod 3 with side plate large and hind lobe small. 2nd joint almost rounded, hind margin strongly rounded near base and narrowing distally. 6th joint distally widened with 3 stout spines of which innermost is curved outwards. Dactylus stout and curved. Peræopod 4 with 2nd joint oblong-oval, widest near the base and narrowing distally, joints 4-6 long and

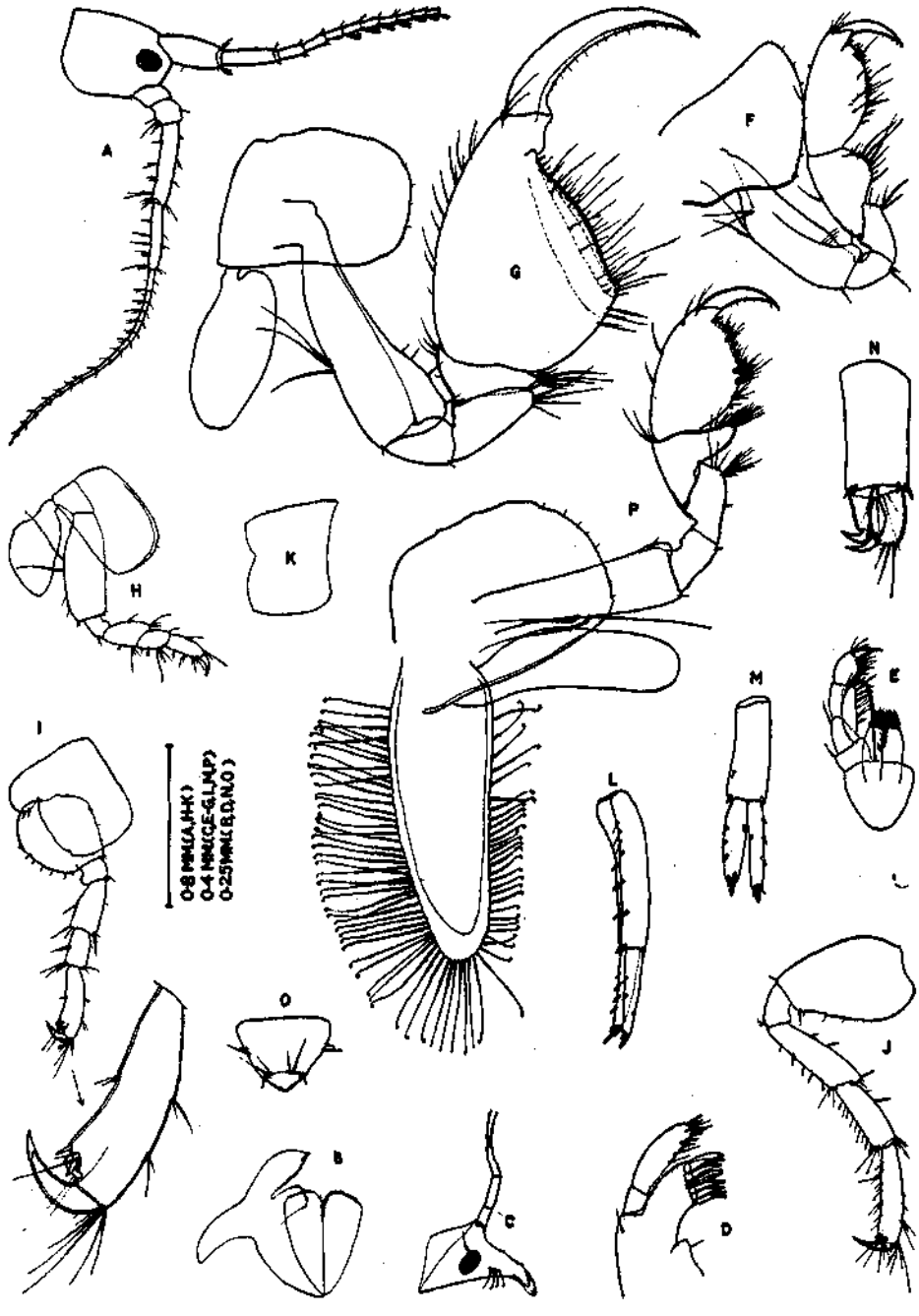

FIG. 6. *Ampithoe kulafi* J. L. Barnard. Male : A. head with antennae ; B. lower lip ; C. mandible ; D. maxilla 1 ; E. maxilliped ; F, G. gnathopods 1, 2 ; H, I, J. peraeopods 1, 3, 4 ; K. epimeral plate 3 ; L, M, N. uropods 1, 2, 3 ; O. telson. Female : P. gnathopod 2.

setose on front margin and with a palm on 6th joint as described above. Peraeopod 5 similar to 4th but longer.

Uropod 1 with peduncle twice as long as outer ramus and with a small distal process. Inner ramus a little longer than outer. Uropod 2 with peduncle longer than rami. Inner ramus a little longer than outer. Uropod 3 with peduncle more than twice as long as rami. Rami laminar, outer with two uncinate spines.

Telson tubular, strongly narrowing distally, lateral margins with a pair of setæ, lateral angle with a short seta and a pair of long setæ medial to it.

Female : Similar to the male but of lesser build. Gnathopod 2 larger than 1st. 2nd joint long with anterodistal lobe feeble. 5th joint half as long as 6th, hind lobe produced and partly encircling 6th and with brushlike setæ. 6th joint oval, narrow at base and widest near the middle. Palm with short setæ, oblique, slightly sinuous and defined by a stout spine. Dactylus strongly arched and fitting palm. Incubatory lamellæ with setæ coiled at the tip.

Remarks : Barnard, J. L. (1965b) described and figured an undetermined species questionably assigned to the genus *Pleonexes*, which he later (1970) named as *A. kulafi* and also made this genus a subgenus of *Ampithoe*. The present material closely agrees with Barnard's description and figures in almost every detail. Barnard's material (single male) is however immature agreeing with some small specimens in the present material in the broad and plumpy 6th joint of gnathopod 2. The female not described before has now been described.

Distribution : Ifaluk Atoll, Caroline Islands (Micronesia). This is the first record of this species from India.

SUMMARY

Amphipods of the family Ampithoidæ from the Madras coast are dealt with in this paper. Besides *Ampithoe ramondi* Audouin, *Cymadusa filosa* Savigny, *C. sardenta* (Oliveira) and *Paragrubia vorax* Chevreux already known from Indian seas, two new species of *Ampithoe* (*A. cavimana* n.sp. and *A. platycera* n.sp.) and three new records (*A. falsa* K. H. Barnard, *A. alluaudi* Chevreux and *A. kulafi* J. L. Barnard) are described and figured.

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