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Records of the Zoological Survey of India

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RECORDS
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CONTENTS

INTRODUCTION

During the research work from 1990 to 1997 on freshwater prawns of family Atyidae and Palaemonidae from Kanchipuram and Thiruvallur district of Tamilnadu, India, one new species of the genus *Caridina* H.Milne Edwards were described in this paper.

These Kanchipuram and Thiruvallur district, popularly known as the districts of tanks in situated on the East coast of Tamilnadu and lies between, 12 12' and 13 42' North latitude and 78.32' and 80.22' East longitude. The total geographical areas of these districts are 7.86 lakhs hectares. The coastlines of these districts are 225 km. Both North East and South West monsoon benefit this agriculture dependent district. The avarage rainfall is 1211mm.

The abbreviation ZSI is used for Zoological Survey of India, Chennai (Madras).

FAMILY ATYIDAE

1. ***Caridina gracilirostris*** de Man 1892.
(Fig. 1-4)

1892. *Caridina gracilirostris* de Man, *Max, Weber Zool, Ergeb.*, **2** : 392.

1913. *Caridina gracilirostris* Bouvier, *Bull, Sci. Ent. France,* 177-182.

1918. *Caridina gracilirostris* Kemp, *Mum, Asiat.Soc. Bengal,* **6** : 282.

1925. *Caridina gracilirostris* Bouvier, *Encycl. Ent.*, **4** : 142.

1942. *Caridina gracilirostris* Natarajan, Curr, Sci., **11** : 245.

1961. *Caridina gracilirostris* Johnson, *Bull, Reffles Mus, Singapore* **26** : 124.

1962. *Caridina gracilirostris* Arudpragasam and Costa, Crustaceana, **4** : 7.

1963. *Caridina gracilirostris gracilirostris* Johnson, *Bull, Natn. Mus. St. Singapore* **32** : 20.

1964. *Caridina gracilirostris* Pillai, *J. Mar. Biol. Ass. India,* **6** : 43.

1965. non *Caridina gracilirostris* Holthuis, *Mem. Mus. Nat. Hist. Paris,* **33** : 23.

1971. *Caridina gracilirostris gracilirostris* Tiwari and Pillai, *Crustaceana,* **21** : 83.

1972. *Caridina gracilirostris* Costa, *Bull. Fish. Res. Stn. Sri Lanka,* (Ceylon) **23** : 129.

1973. *Caridina pseudogracilirostris* Thomas *et al., J. Mar. Biol. Ass, India,* **15** : 871.

1977. *Caridina gracilirostris gracilirostris* Ravindranath, Ph.D. Thesis, (unpublished).

1984. *Caridina gracilirostris* Gurney, *J. Nat. Hist.* **18**(4) : 567-590

1994. *Caridina gracilirostris* Richard and Chandran *J. Bombay nat. Hist. Soc.*, Vol. 91 No. **2** : 242-259.

Materials Examined : 100 males (26 to 30mm), 75 non berried females (26 to 30mm), 90 berried females (28 to 35mm) collected from river Koratalaiyar at Janappan Chatram and

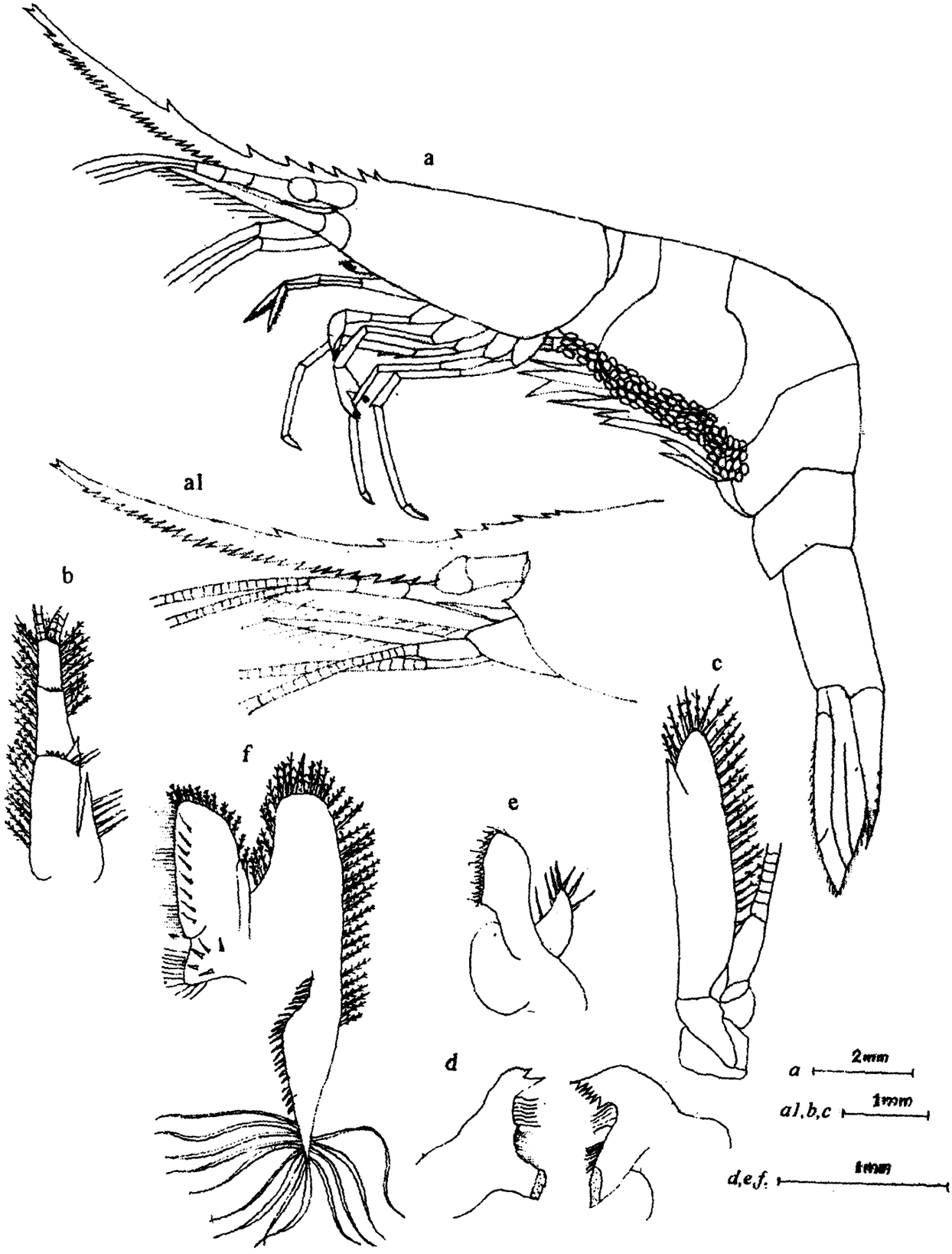

Fig - 1 ***Caridina gracilirostris***

Naapalayam, River Pallar at Vallipuram. Lakes at Red Hills, Solawaram and Sriperumbudur. Ponds at Chetpet, Chembarambakam, Manimangalam, Manivakkam, Mathur, Nursery pond at Chambarambakam and Pandoor.

Z.S.I. A/C : 1

Diagnosis : Maximun size about 35mm. A dorsal hump on 3rd abdominal segment. Rostral formula $\frac{7 - 8}{27 - 37}$ mostly $\frac{7 - 8}{34 - 36}$ with 1 or 2 postorbital.

Almost the distal half of the rostrum unarmed. The tip gives a bifid look with one sub terminal spine. Carapace without pterygostominal spine. Antennal spines well developed. Antennular peduncle about 0.5 to 0.8 times the carapace. Carpus of the first cheliped with a moderately deep anterior excavation and 1.2 to 1.9 times as long as broad. Carpus of the second cheliped without and excavation and 305 to 4.9 times as long as its breadth. Propodus of the third pereiopod 3.6 to 4,6 times for dactylus. Dactylusis 2.6 to 4.0 times as long as its breadth. Fifth pereiopod with propodus 3.09 to 4.7 times its dactylus. Dactylus is 2.8 to 4.9 times longer than breadth. First pleopod of male without *appendix interna*. Preanal carina with a spine. Posterior margin of the telson with 3 pairs of shout short spine like processes and one or two minute plumose processes. Uropod diaeresis with 7 to 9 (mostly 7 or 8) spinules. Eggs small and measures 0.26 to 0.39 x 0.49 to 0.60 mm. Number varying from 210 to 450. Larval development prolonged with 6 larval stages before the post larva.

Description

Rostrum (Fig : 1a & a1) : Distinctly out reaching the antennal scale and the antennular peduncle, distal end of the rostrum upturned,

Rostral formula $\frac{7 - 8}{27 - 37}$ mostly $\frac{7 - 8}{34 - 36}$ with 1 or 2 postorbital.

Dorsal teeth widely spaced and occupy the proximal end, being placed at the proximal 0.40 to 0.45 of the total length. One sub terminal tooth present (rarely two), ventral teeth are closely set arranged almost top of the tip.

Carapace (Fig : 1b) : Without pterygostomial spine, antennal spine well developed. Proportion of the rostrum to that of carapace is 1.2 to 2.3. Cornea rounded and well pigmented.

Antennule (Fig : 1b) : Peduncle slender and is about 0.5 to 0.8 times as long as carapace. Stylocerite slender and long and reaches more than 3/4th of the basal segment. Aesthetasc bearing segments in male and female differ, being 21-26 in the females and 37-43 in the males.

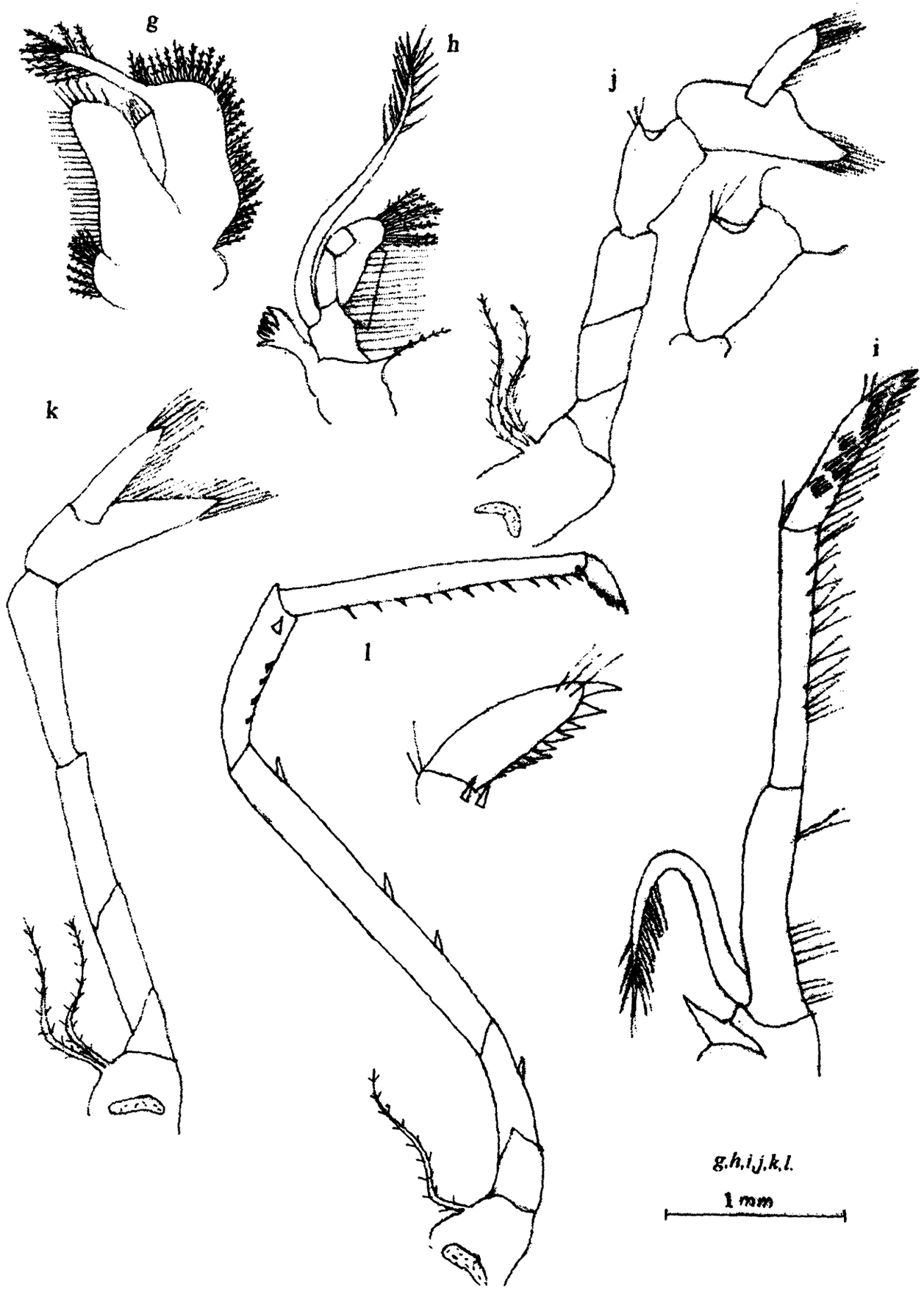

Fig - 2 ***Caridina gracilirostris***

Antenna (Fig : 1c) : Scale long about 4.0 to 4.8 times as long as broad. Outer margin straight terminating in a string tooth, anterior margin of the lamella triangular and over reaches the outer terminal tooth.

Mouth parts (Fig : 1 d,e,f & Fig 2 g,h,i.) : Normal as in figures.

Mandible (Fig : 1d) asymmetrical without palp.

Third maxilliped (Fig : 2 I) : extends up to the second segments of the antennular peduncle. Exopod reaching the middle of the second segment of the endopod. Epipod present.

First pleopod (Fig : 2 j) : Chelate extending up to the first segment of antennular peduncle. Fingers with brushes of hairs. 0.8 to 1.5 times as long as palm. Chela 1.50 to 2.46 times as long as broad. Carpus with a moderately deep excavation and is 1.2 to 1.9 times as long as broad.

Second pereiopod (Fig : 2 k) : Chelate and slender extending up to first segment of antennular peduncle. Fingers with brushes of hair, 1.1 to 1.7 times as long the palm. Chela 1.8 to 3.10 times as long as broad. Carpus slender, without slender, without excavation, 3.5 to 4.9 times as long as broad.

Third pereiopod (Fig : 2 l) : Slender, extends up to the second segment of the antennular peduncle. Dactylus 2.6 to 4.0 times along as broad with 8 to 11 spines (mostly 9 or 10) on the posterior margin. Propodus 9.5 to 13.3 times as long as broad and bears small spinules on its posterior margin. It is 3.6 to 4.6 times the dactylus and 0.28 to 0.51 times the carapace. Carpus with a subterminal spine and a row of small spines and measures about 0.50 to 0.67 times the propodus. Merus 1.69 to 2.2 times the carpus and 2 or 3 stout spines on the posterior margin.

Fourth pereiopod (Fig : 3 m) : Much slender and is similar to the third. Epipod present on all the first 4 pereiopods.

Fifth pereiopod (Fig : 3 n) : Much slender, extends up to the first segment of antennular peduncle, Dactylus 2.8 to 4.9 times the breath and bears 34 to 46 (mostly 40 to 45) spinules on the posterior margins and gives a comb like appearance. Propodus 11.4 to 15.5 times as long as broad and bears a row of spinuls on its inner margin. It is 3.09 to 4.07 times the dactylus and 0.35 to 0.60 times the carapace. Carpus bears a subterminal spine and a row of small spines on its posterior margin. Carpus 0.42 to 0.50 times the propodus. Merus 1.40 to 1.80 times the carpus and bears 2 stout spines on the posterior margin. Ischium unarmed. 1 or 2 setobranches present on the coxa of all pereiopods.

Abdomen (Fig : 1a) : With characteristic hump on the 3rd segment. Abdomen very slender compared to the rest of the species recorded in this work. Pleura of the first 3

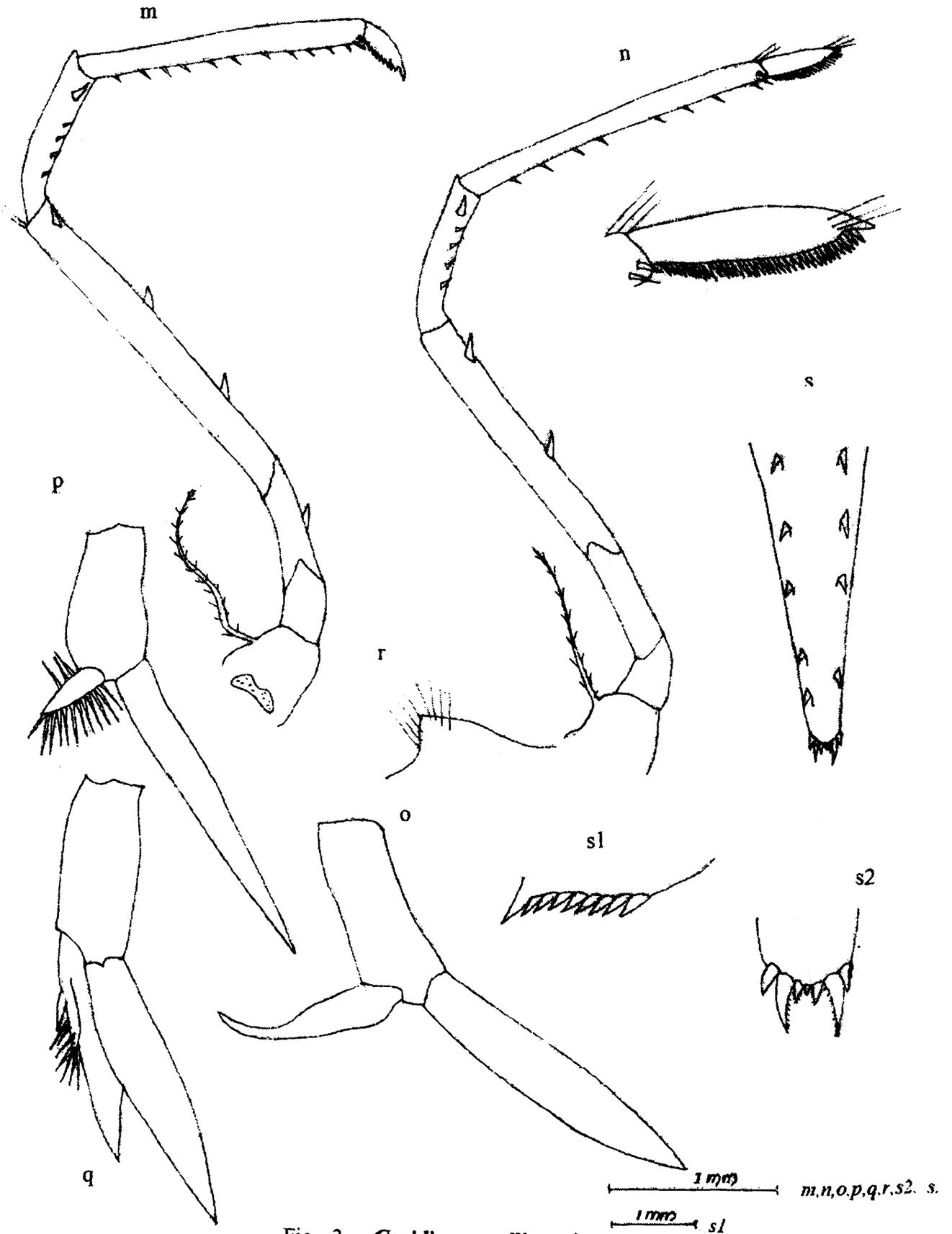

Fig - 3 ***Caridina gracilirostris***

segments round while the last 3 taper towards the telson. Sixth segment 0.57 to 1.00 times as long as carapace.

First pleopod : In both sexes without *appendix interna.* Endopod of the first pleopod of female (Fig 3 o) measuring 0.5 to 0.75 times the exopod and 3.08 to 5.20 times as long as its breadth. In male (Fig : 3 p) 0.20 to 0.28 times the exopod and 2.39 to 2.80 times as long as its breadth.

Second male pleopod (Fig : 3 q) : Possesses appendix masculina 0.32 to 0.40 times as long as the endopod and 1.4 to 1.9 times the *appendix interna.*

Preanal carina (Fig : 3 r) : Distinct with backwardly directed spine and armed with few setae.

Telson (Fig : 3 s & s 2) : Elongated with a narrow posterior margin and almost equal to the 6th abdominal segment with 4 or 5 (mostly 5) pairs of dorsal spines and 3 pairs of posterior spine like processes which are very sparsely plumose. The outer most is not plumose on either margin. Either one or two minute plumose processes are seen.

Uropod (Fig : 3 sl) : Extends well beyond the telson, the spinules on the diaeresis 7 to 9 (mostly 7 or 8).

Eggs and development : Eggs are yellow in colour. They are smaller in size measuring 0.26 to 0.39 x 0.49 to 0.60 mm and the number varies from 210 to 450. Development is prolonged with 6+1 postlarval stages.

Colour in live condition : *Caridina gracilirostis* occurs mostly in less vegetated, yet cool waters. The chromatophores are not remarkable. Very few chromatophores of the dark red colour are scattered on the rostrum, carapace and telson.

Discussion : *C. gracilirostis* has been reported from Indo-Malayan archipelago by several workers (de Man, 1892; Kemp, 1918; Natarajan, 1942; Tiwari and Pillai, 1971; Costa, 1972; Ravindranath, 1977; Richard and Chandran, 1994)

While describing the Atyidae of Madagascar, Ho;thuis (1965), described *C. gracilirostis.* In this material, in first pleopod of the males, a well developed *appendix interna* is present. The telson tip is tapering and ends in a median spine.

Later in 1973, Thomas et al., who studied the Indian form collected from Cochin observed that their specimens differed from the Madagascar material, in not possessing *appendix interna* in the first pleopods and in having rounded telson without any median spine. Based on these differences they erected a new spices *C. pseudogracilirostris.*

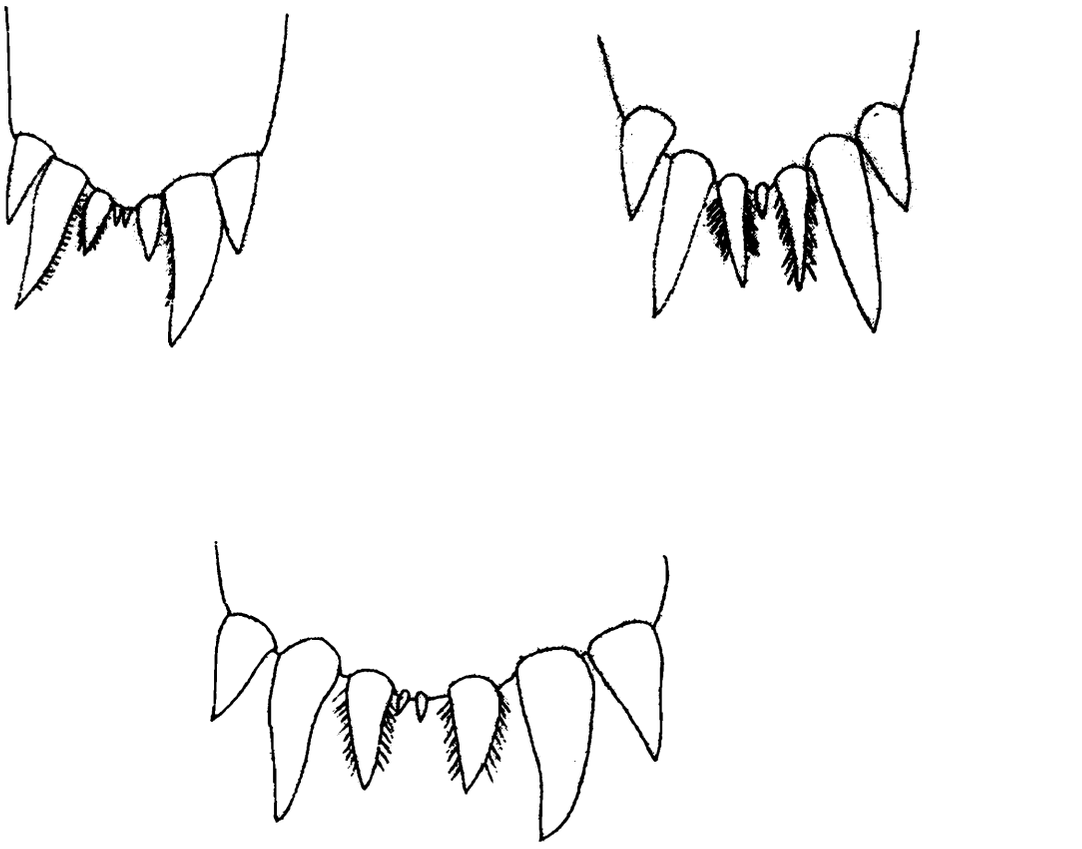

Fig - 4 ***Caridina gracilirostris***

Richard and Chandran, while describing the atyid prawns of Madras, throughly exemined the specimens of *C. gracilirostis* collected from type locality as well as from different parts of India & Malaya (Z.S.I. Calcutta) and brought to light that in all the Indian forms the males do not possess appexdix interna on the first pleopod and the telson in rounded at any stage.

C. gracilirostis collected from the freshwater bodies of Chengalpattu district, agrees with all the Indian forms (de Man 1892; Natarajan, 1942; Pillai, 1964; Tiwari & Pillai, 1971; Ravindranath, 1977; Richard & Chandran, 1994) in not possessing *appendix interna* in the first pleopod of male.

The telson tip is of three different types and the below provides the details as studied in 100 specimens. (fig. - 4)

C. gracilirostis collected from Chengalpattu district.

Telson Round without median spine	29 Specimens
Telson narrow without median spine	47 Specimens
Telson narrow with median spine	24 Specimens

The telson of the Changalpattu district forms always possesses either one or two minute spines at the posterior end of the telson. The telson may be narrow or rounded. Thus the present species is different from the earlier forms in possessing one or two minute processes. However these minute processes either one or two, are different from the median spine of the Madagascar material (Holthuis 1965).

In spite of this variation of the telson tip, the present material well conforms with the Indian forms and resembles the Indian forms in not possessing an *appendix interna* in the first pleopods of the male and in thus alloted to *C. gracilirostis.* The Madagascar forms (Holthuis 1950, Gurney, 1984) are distinct from *C. gracilirostis,* in possessing an *appendix interna* on the first pleopod of the male.

2. ***Caridina gracilipes*** de Man 1892.

(Fig. 5-7)

1892. *Caridina nilotica var. gracilipes* de Man, *Max, Weber Zool, Ergeb.*, **2** : 387

1908. *Caridina nilotica var. gracilipes* de Man, *Rec. Indian Mus.*, **2** : 270

1915. *Caridina nilotica var. bengalensis* Kemp, *Mem. Indian Mus.*, **5** : 307

1918. *Caridina niiotica gracilipes* Kemp, *Rec. Indian Mus.*, **14** : 275

1925. *Caridina nilotica var. bengalensis* Bouvier, *Encucl. Ent. Ser. A.*, **4** : 154

1973. *Caridina nilotica (Roux)var. bengalensis* Wycliffe, *J Madurai. Univ.* **1** : 161

1977. *Caridina bengalensis* Ravindranath, *Ph.D. Thesis, unpublished* 1–239

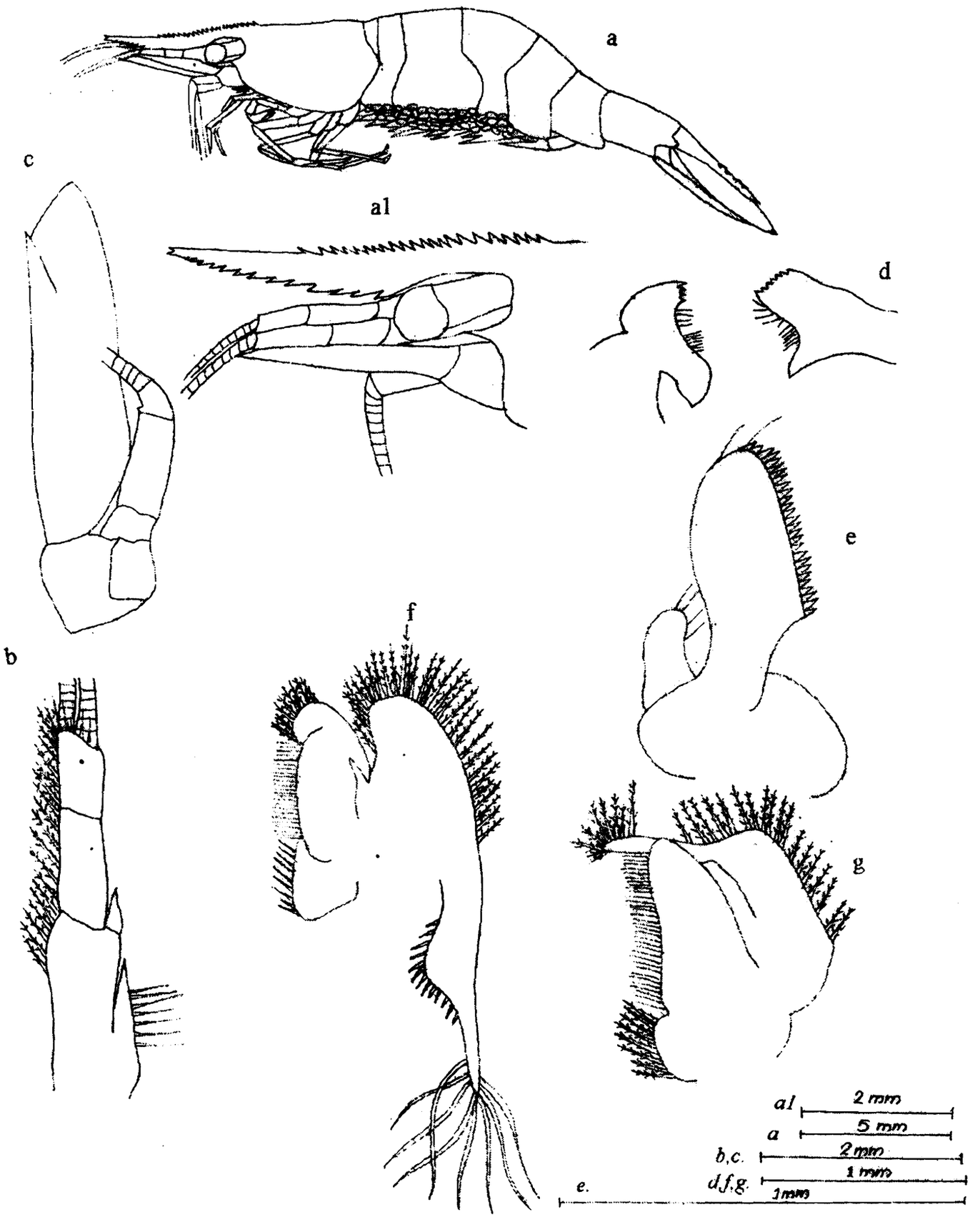

Fig - 5 ***Caridina gracilipes***

1978. *Caridina nilotica var. bengalensis* Anatha Raman *et al., Vignana Bharathi* 4(2) : 86

1994. *Caridina gracilipes* Richard and Chandran, *J. Bombay nat. Hist. Soc.*, Vol 91, No. 2., pp 242-259.

Material Examined : 500 males (15 to 24mm), 300 non berried females (17 to 25mm) and 300 berried females (16 to 33mm) collected from River Arani at Arani, Periapalayam, Ponneri, Puduvoli, and Thiruvallavoli (Kattur), River Cheyyar at Magaral, River Coovam at Aranvoli, Maduravoli, Perambakkam and Thiruvallur. River Kambakkal at Injambakkam, River Koratalaiyar at Damarapakkam and Naapalayam, River Nagari at Kanagamma chatram and River Pallar at Athur Kancheepuram, Sirukaveripakkam, Vallipuram, Walajabad and River Adyar at Saidapet. Lakes at Chembarambakkam, Chengalpattu, Kuvam, Mathurandakam, Poondi, Solawaram and Uthiramerur. Ponds at Anupambattu, Arasur, Cheyyur, Chengalpattu, Chembarambakam, Cherukanur, Chetpet, Chunampet, Ennore, Eliambedu, Gummidipundi, Ikkadu, Kadapakkam, Kanakammachantram, Kancheepuram, Kunnathur, Kunnavakkam, Madarapakkam, Mathurantakam, Mammalapuram, Mammandoor, Manamathi, Manivakkam, Mathur, Medur, Musaravakkam, Orgadam, Orathi, Padappai, Pallilpattu, Pandoor, Peruvoli, Ponneri, Poondi, Redipalayam, Roshanagar, Sathyavedu, Serrapananjeri, Sriperumbudur, SRM Nagar, Sunnambukalam, Thirukalukundram, Thirupalaivanam, Thirupukuzhi, Thiruverkadu, Uthiramerur, Vallam, Vattambakkam, Vepambattu and YWCA pond.

Z.S.I. A/c No.-2

Diagnosis : Maximum size about 33mm. A dorsal hump on 3rd abdomina; segment. Rostrum straight equal to or slightly longer than antennal scale.

Rostral formula $\frac{12 - 28}{13 - 26}$ (mostly $\frac{16 - 24}{14 - 19}$) with 1 or 2 postorbitals (mostly 2).

Dorsal margin of the rostrum with a distal gap which may rarely be inturrupted by one or two intermediate teeth. 0 to 2 subterminals may be seen. Carapace without pterygostomial spine. Antennal spines with orbital expansion. Antennular peduncle about 0.50 to 0.91 times the carapace. Carpus of the first cheliped with a slight anterior excavation and 1.97 to 2.71 times as long as broad. Carpus of the second cheliped without any excavation and 4.54 to 5.28 times as long as broad. Propodus of the third pereiopod 3.38 to 5.30 times the dactylus. Dactylus is 2.51 to 3.94 times its breadth. Fifth pereiopod with propodus 2.90 to 4.12 times the dactylus. Dactylus 4.26 to 5.18 times its breadth. First pleopod of male with a well developed *appendix interna* over-reaching the endopod. Preanal carina with a distince spine. Posterior margin of the telson pointed or blunt with 3 or 4 pairs of plumose processes. Uropod diaeresis with 9 to 12 (mostly 10 or 11) spines. Eggs measure 0.24 to 0.37 x 0.40 to 0.56 mm., and the number varying from 150 to 850. Larval development prolonged with 7 larval stages before the post larva.

Description

Rostrum (Fig. 5 a, a1) : Equal to or slightly longer than the antennal scale, distal end slightly turned upwards.

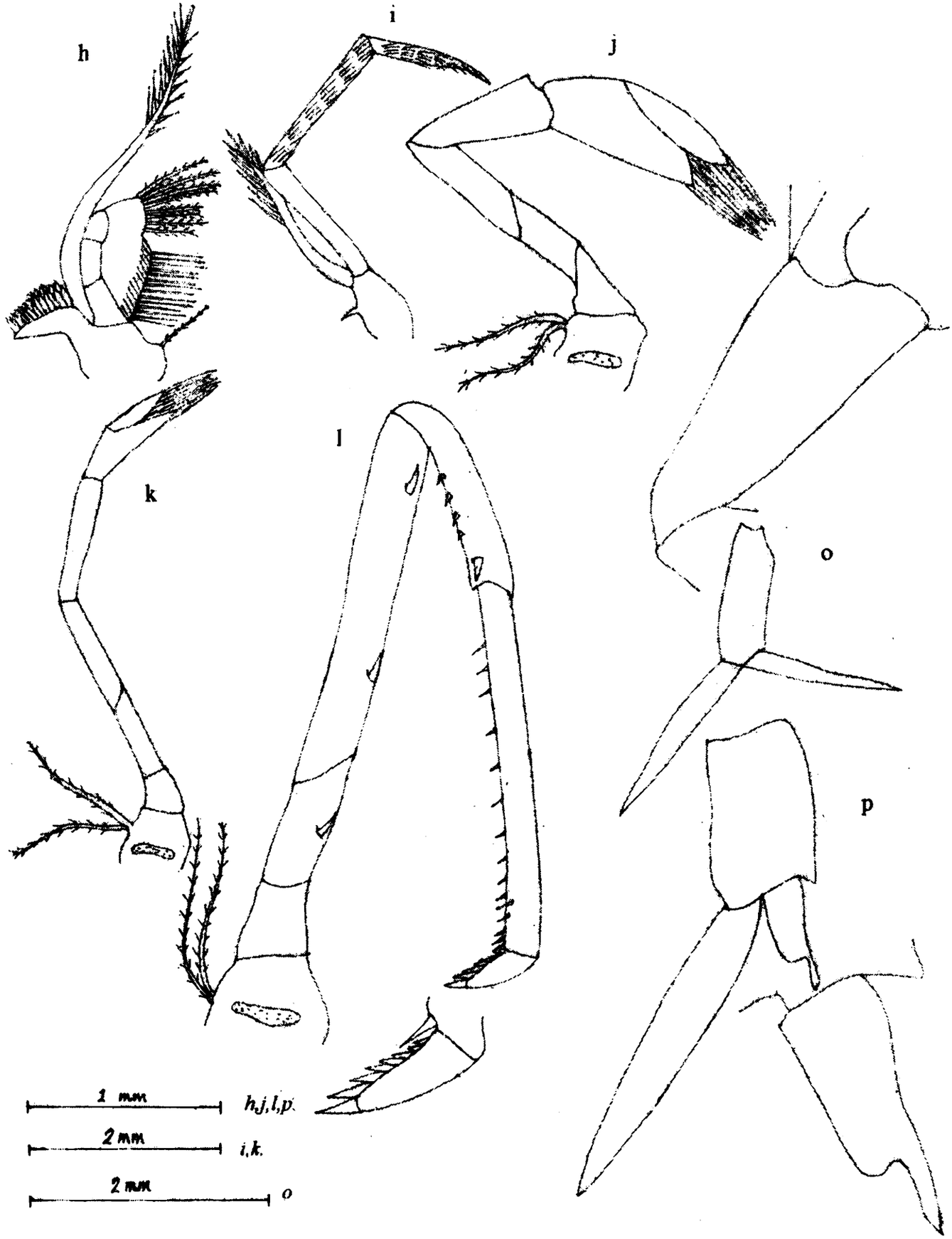

Fig - 6 ***Caridina gracilipes***

Rostral formula $\frac{12 - 28}{13 - 26}$ (mostly $\frac{16 - 24}{14 - 19}$) with 1 or 2 postorbitals (mostly 2).

Dorsal teeth are compact leaving a distal unarmed portion which ends usually with 0 to 2 sub-terminal giving a bifid look (rarely even 3 or 4 subterminals are met with). Ventral teeth are arranged compactly almost up to the tip. The ratio of the unarmed portion of the rostrum to the proximal length of armed portion is 1.0 to 2.00.

Carapace (Fig. 5,a) : Without pterygostomial spines, antennal spine well devaloped with an orbital expansion. The proportion of the rostrum to that of carapace is 0.8 to 1.4. **Cornea** rounded and well pigmented.

Antennule (Fig. 5,b) : Peduncle slender and is about 0.50 to 0.91 times as long as carapace. Stylocerite reaching 3/4th of the basal segment, anterolateral teeth of the basal segment is well produced and reaches the basal 1/3 of the second segment. The aesthetasc bearing in females are 20 to 35 and in males 38 to 47.

Antenna (Fig. 5,c) : Scale about 3.4 to 3.92 times as long as broad. Outer margin slightly convex terminating in a sharp spine, anterior margin of the lamella triangular and over reaches the outer terminal tooth.

Mouth parts (Fig. 5, d, e, f, g.) : Normal as in figures.

Mandible (Fig. 5, d) : asymmetrical without palp.

Third maxilliped (Fig 6,i) : extends upto the second segment of antennular peduncle. Expod reaching about ½ of the of the second segment of the endopod. Epipod present.

First pereiopod (Fig. 6, j) : Chelate extending up to the base of the antennular peduncle. Fingers with brushes of hairs. 1.30 to 1.67 times as long as the palm. Chela 2.30 to 2.59 times as long as broad. Carpus slightly excavated and is 1.97 to 2.71 times as long as its breadth.

Second pereiopod (Fig. 6 k) : Chelate, slender extending upto second segment of antennular peduncle. Fingers with brushes of hair, 1.25 to 1.70 times as long as the palm. Chela 2.85 to 3.60 times as long as broad. Carpus slender, without excavation, and 4.54 to 5.28 times as long as broad.

Third pereiopod (Fig. 6 l) : Slender, extends up to the tip of the antennular peduncle. Dactylus 2.51 to 3.94 times as along as broad with 7 to 10 spines (mostly 8 or 9) on the posterior margin. Propodus 7.10 to 11.34 times as long as broad and bears small spinules on its posterior margin. It is 3.38 to 5.30 times as long as its dactylus and 0.30 to 0.45 times

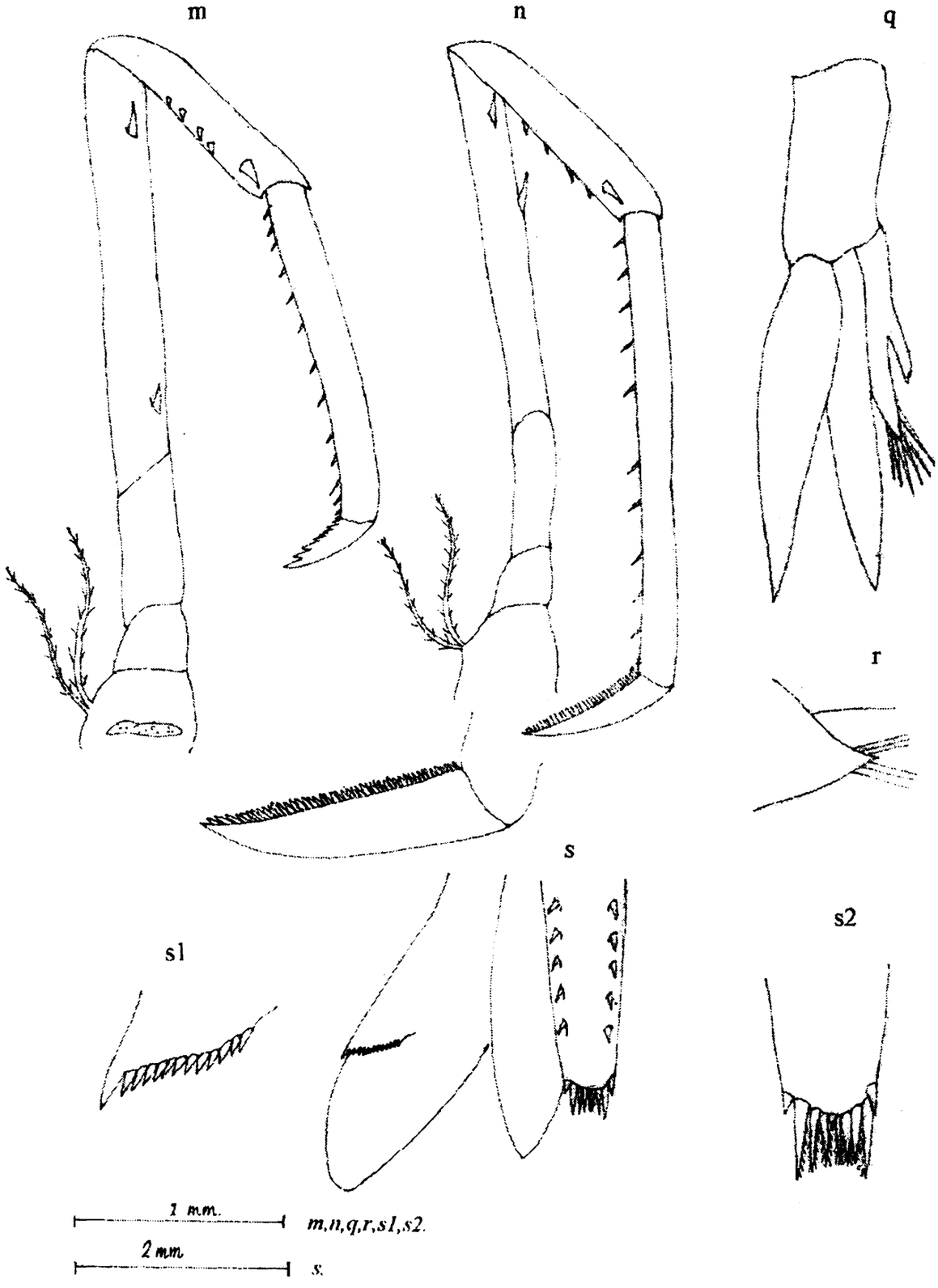

Fig - 7 ***Caridina gracilipes***

the carapace. Carpus with a subterminal spine and a row of small spines, measures almost 0.44 to 0.60 times the propodus. Merus about 1.70 to 1.80 times the carpus and bears 2 or 4 stout spines on the posterior margin. Ischium with a big spine on the posterior margin.

Fourth pereiopod (Fig. 7,m) : Slender, extends upto the second segment of antennular peduncle. Dactylus 4.26 to 5.18 times the breadth and bears 44 to 61 spinules on the posterior margin and giving a comb like appearance. Propodus 9.38 to 13.11 times as long as broad and bears a row od spinules on its inner margin. It is 2.90 to 4.12 times the dectylus and 0.40 to 0.60 times the carapace. Carpus bears a subterminal spine and a row of small spines on its posterior margin and measures 0.50 to 0.60 times the propodus. Merus 1.40 to 2.0 times the carpus and bears 2 or 3 stout spines. Ischium unarmed.

2 **setobranches** present on all pereiopods.

Abdomen (Fig. 5,a) : With characteristic hump on the 3rd segment. Pleura of the first 3 segments round while the last 3 taper towards the telson. Sixth segment 0.60 to 0.90 times as long as carapace.

First pleopod : Endopod of first pleopod of female (Fig. 6,o) without *appendix interna* and is 0.60 to 0.88 times the exopod and 4.32 to 7.50 times as long as broad. Endopod in male (Fig. 6,p) has a distinct *appendix interna* and is 0.24 to 0.33 times the exopod and 2.10 to 3.00 times as its breadth.

Second male pleopod (Fig. 7,q) : Possesses appendix masculina 0.32 to 0.60 times as long as the endopod and 1.30 to 2.10 times the *appendix interna.*

Preanal carina (Fig. 7,r) : Strong with stout spine and few setae.

Telson (Fig. 7,s,s2) : Dorsal spines are 4 to 6 pairs. Posterior margin of the telson pointed or blunt with 3 or 4 pairs of plumose processes. The outer most is plumose on the inner side only. Telson almost equal to the 6th abdominal segment.

Uropod (Fig. 7,s,s1) : Extends well beyond the telson, the spinules on the diaeresis 9 to 12 (mostly 10 or 11).

Eggs and development : Eggs are yellow in colour. They are smaller in size measuring 0.24 to 0.37 x 0.40 to 0.56 mm and the number varies from 150 to 850. Development is prolonged having 7 larval stages before the postlarval stages.

Colour in live condition : Healthy greenish colour is seen in freshly collected animals and is maintained when kept in mud pots and cement tanks, while pale yellow colour is obtained when maintained in glass aquaria. The chromatophores are not remarkable but for

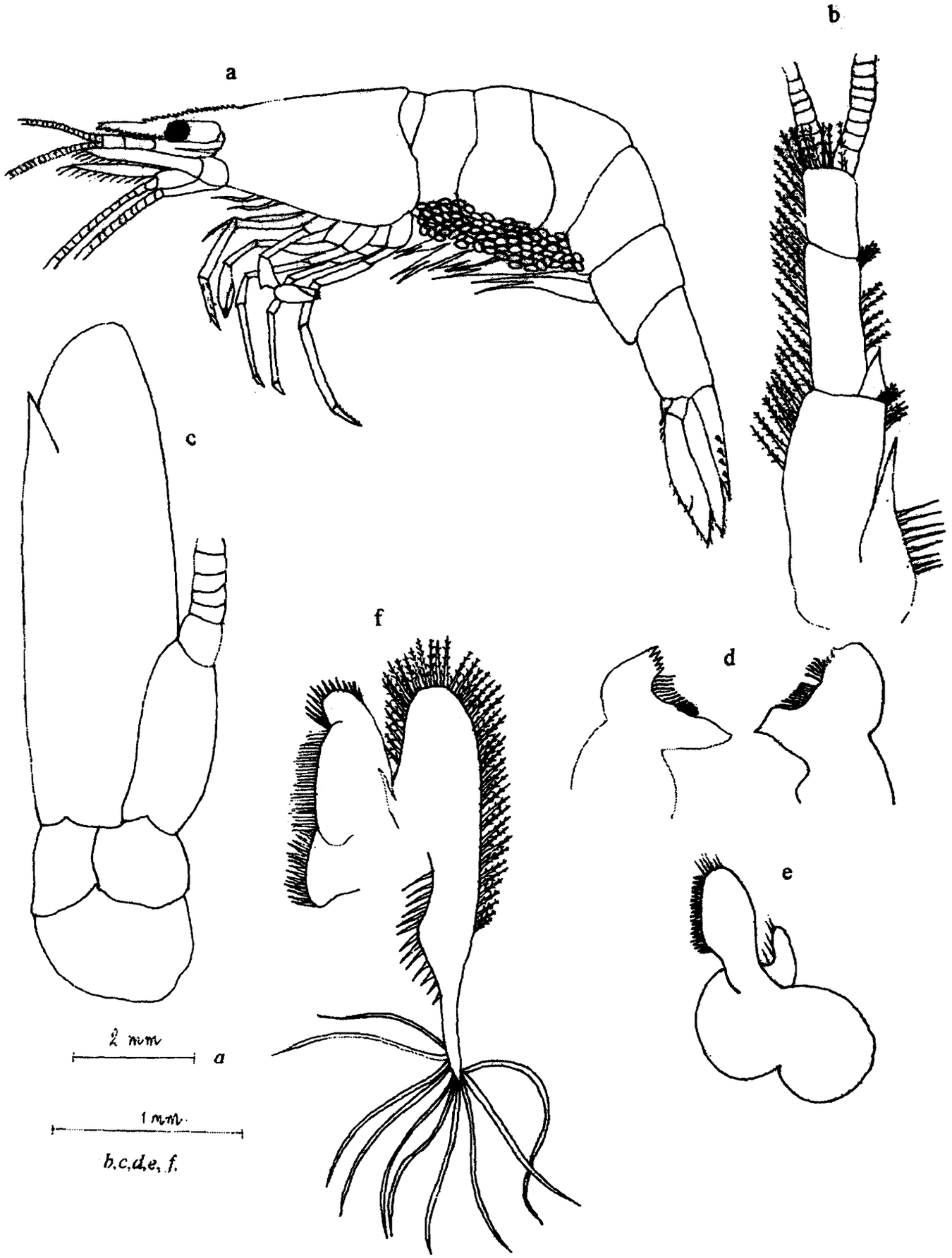

Fig - 8 ***Caridina bengalensis***

the orange–red stellate chromatophores which are dense in the region of the ventral margin of the rostrum.

Discussion dealt along with *C.bengalensis.*

3. ***Caridina bengakensis*** de Man., 1908.
(Fig. : 8–11)

1893. *Caridina wyckii* Henderson, *Tran. linn Soc, London.* 5-434

1903. *Caridina wyckii* Nobili, *Boll. Mus. Zool. Anant. Comp Torino.* **18** : 6

1908. *Caridina nilotica var. bengalensis* de Man. *Rec. Indian Mus.,* **2** : 265

Material Examined : 40 males (11 to 15 mm), 25 non berried females (15 to 19 mm), 20 berried females (17 to 22 mm) collected from ponds at Sunnambukulam.

Z.S.I. A/C : 3

Diagnosis : Maximum size about 22 mm. A dorsal hump on the 3rd abdominal segment. Rostrum straight equal to or shorter than antennal scale.

Rostral formula $\frac{16 - 26}{7 - 16}$ (mostly $\frac{18 - 21}{9 - 13}$) with 2 to 4 (mostly 3) postorbitals.

Dorsal margin of the rostrum with a distal gap interrupted, by one or two teeth, 0 to 2 subterminal may be seen. Carapace without pterygostomial spine. Antennal spines with orbital expansion. Antennular peduncle about 0.4 to 1.0 times the carapace. Carpus of the first cheliped with slight anterior excavation and 1.56 to 2.13 times as long as broad. Carpus of the second cheliped without any excavation and 3.48 to 6.05 times as long as its breadth. Propodus of the third pereiopod 2.77 to 4.66 times the dactylus. Dactylus is 3.22 to 4.40 times as long as its breadth. Fifth pereiopod with propodus 2.74 to 3.41 times its dactylus. Dactylus is 3.40 to 6.50 times as long as its breadth. First pleopod of male without *appendix interna.* Preanal carina, with distinct spine. Posterior margin of the telson with 5 to 8 plumose processes always with a *appendix interna.* Uropod diaeresis with 9 to 11 (mostly 9) spinules. Eggs measures 0.29 to 0.39 x 0.44 to 0.49mm, number varying from 115 to 260. Larval development prolonged with 7 larval stages brfore the post larva.

Description

Rostrum (Fig. 8,a) : Straight equal to or shorter than antennular scale.

Rostral formula $\frac{16 - 26}{7 - 16}$ (mostly $\frac{18 - 21}{9 - 13}$) with 2 to 4 (mostly 3) postorbitals.

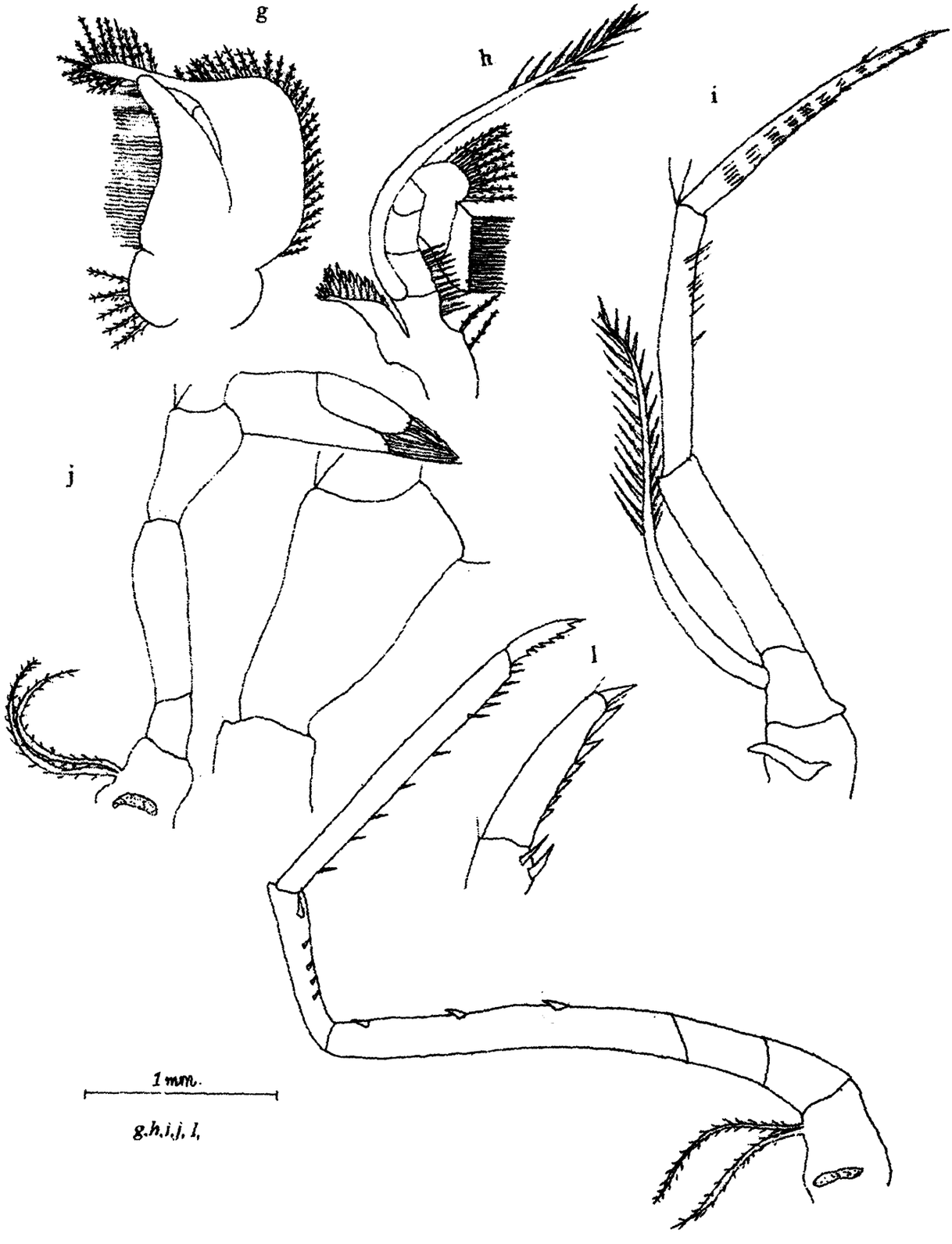

Fig - 9 ***Caridina bengalensis***

Dorsal margin of the rostrum with a distal gap interruped by one or two teeth. 0 to 2 subterminals giving a bifid look. Ventral teeth are arranged almost upto the tip leaving 2 teeth space at the tip.

Carapace (Fig. 8,a) : Without pterygostomial spines, antennal spine well developed with an obtital expansion. The proportion of the rostrum to that of carapace is 0.60 to 1.00 times.

Antennule (Fig. 8,b) : Peduncle slender and is about 0.4 to 1.0 times as long as carapace. Stylocerite reaching about 3/4th of the basal segment. Anterolateral teeth of the basal segment well produced and reaches the basal 1/3rd of the 2nd segment. The aesthetasc bearing segments differ in male and female, being 12-20 in the males and 9-16 in the females.

Antenna (Fig. 8,c) : Scale about 3.1 to 3.4 times as long as broad. Outer margin slightly convex terminating in a sharp spine, anterior margin of the lamella and triangular and over reaches the outer terminal tooth.

Mouth parts (Fig. 8,d,e,f & fig. 9,g,h,i) : Nornal as in figures.

Mandible (Fig. 8,d) : asymmetrical without palp.

Third maxilliped (Fig. 9,i) : extends upto the second segment of the antennular peduncle. Exopod reaching about 1/2 of the second segment of endopod. Epipod present.

First pereiopod (Fig. 9,j) : Chelate extendion upto the base of antennular peduncle. Fingers with brushes of hair 0.75 to 2.26 times as long as its breadth. Chela 1.42 to 2.26 times as long as breadth. Carpus slightly excavated and is 1.56 to 2.13 times as long as its breadth.

Second pereiopod (Fig. 10,k) : Chelate, slender extending upto the second segment of the antennular peduncle. Fingers with brushes of hair 1.19 to 1.73 times as long as the palm. Chela 1.86 to 3.33 times as long as broad. Carpus slender without excavation 3.48 to 6.05 times as long as broad.

Third pereiopod (Fig. 9,l) : Slender and extends upto the tip of the antennular peduncle. Dactylus 3.22 to 4.40 times as long as broad with 5 to 9 spines (mostly 6 to 8) on the posterior margin. Propodus 5.84 to 13.60 times as long as broad and bears small spinules on its posterior margin. It is 2.77 to 4.66 times as long as its dactylus and 0.32 to 0.40 times the carapace. Carpus with a subterminal spine and arow of small spines and measures about 0.50 to 0.82 times the propodus. Merus 1.09 to 2.10 times the carpus and 3 to 4 stout on the posterior margin. Ischium with a big spine on the posterior margin.

Fourth pereiopod (Fig. 10,m) : Much slender and is almost similar to the third. Epipod present on all the first 4 pereiopods.

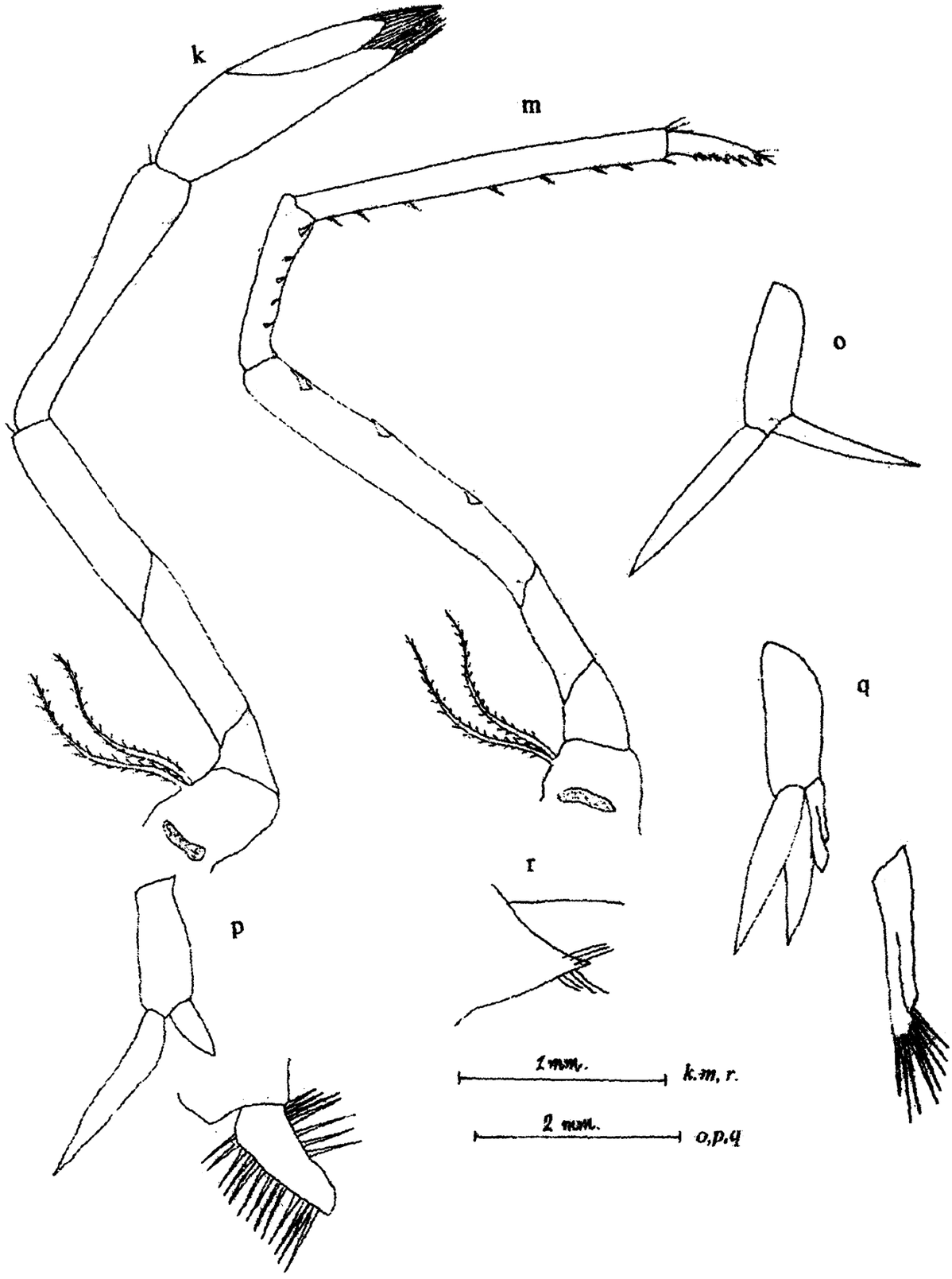

Fig - 10 ***Caridina bengalensis***

Fifth pereiopod (Fig. 11,n) : Slender and extends upto the 2nd segment of the antennulat peduncle. Dactylus 3.40 to 6.50 times the breadth and bears 36 to 54 spinules on the posterior margin and giving a comb like appearance. Propodus 10.22 to 14.00 times as long as broad and bears a roe of spinules on its inner margin. It is 2.74 to 3.41 times the dactylus and 0.40 to 0.53 times the carapace. Carpus bears a subterminal spine and a roe of small spines on its posterior margin. Carpus 0.40 to 0.57 times the propodus. Merus 1.43 to 1.76 times the carpus and bears 2 to 4 stout spines. Ischium unarmed. 2 setobranches present on the all pereiopods.

Abdomen (Fog. 8,a) : With the characteristic hump on the 3rd segment. Pleura of the first segments round while the last 3 taper towards the telson. Sixth abdomonal segment 0.40 to 0.66 times as long as the carapace.

First pleopod : Endopods of first pleopod of female (fig. 10,o) without *appendix interna* and measuring 0.621 to 0.87 times the exopod and 4.37 to 7.40 times as long as its breadth. Endopod in male (Fig. 10,p) also without *appendix interna* 0.22 to 0.32 times the exopod and 1.78 to 2.42 times as long as its breadth.

Second male pleopod (Fig. 10,q) Possesses appendix masculina which is 0.40 to 0.45 times as long as the endopod and 1.30 to 1.55 timesthe *appendix interna.*

Preanal carina (Fig. 10,r) : Strong with a stout spine and few setae.

Telson (Fig. 11,s & s2) : Tapering towards the posterior end and always with a median spine. Dorsal spines are 4 to 6 pairs. Posterior margin with a 5 to 8 plumose processes with a median spine. Telson almost equal to the 6th abdominal segment.

Uropod (Fig. 11,s & s1) : Extends well beyond the telson, the spinules on the diaeresis 9 to 11 (mostly 9).

Eggs and development : Eggs are yellowish in colour, smaller in size measuring 0.29 to 0.32 x 0.44 to 0.49 mm. Fecundity 115 to 260. Development is prolonged, consisting of 7 larval before the postlarval.

Discussion

C. gracilipes de Man, 1892 & *C. bengalensis* de Man, 1908

In 1892 de Man established a new variety to *Caridina nilotica* (Roux) from Celebes. Later he (1908a, 1908b) described a variety to *C. nilotica* (Roux), viz. var. *bengalensis.* He obtained the specimens from Port Canning Lower Bengal. He synonymised Henderson's (1893) *C.wyckii* from Madras and Nobili's (1903) *C.wyckii* from Pondichery to this new

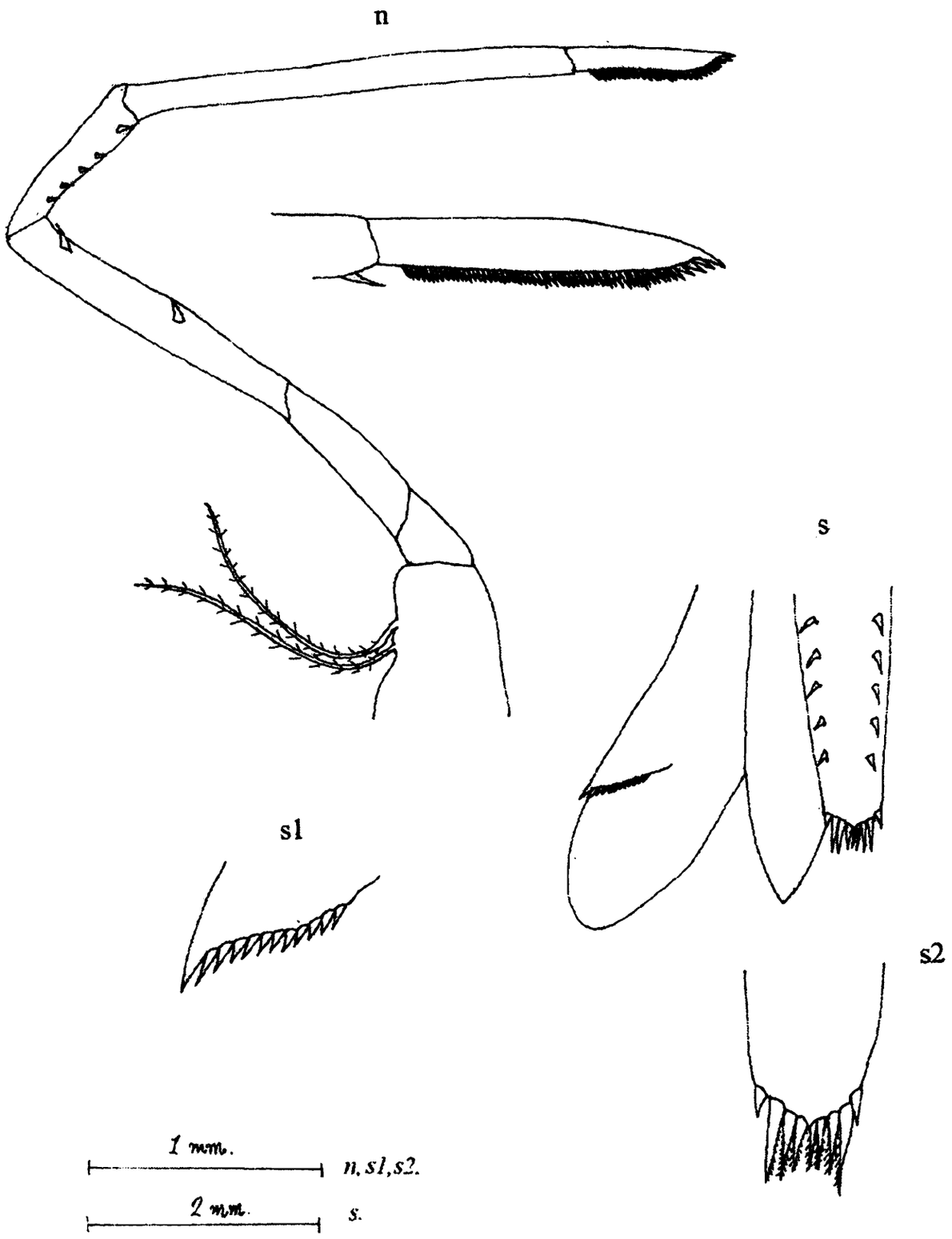

Fig - 11 ***Caridina bengalensis***

variety. While describing his new variety de Man (1909b) was prompt to insist that "it presents a great resemblance to the var. *gracilipes* de Man from Celebes" He listed few difference between the two varieties.

Characters	*C.nilotica* var. *bengalensis*	*C.nilotica* var. *gracilipes*
Proximal teeth on upper margin	Usually varying between 20 to 24	Usually varying between 12 and 20
Terminal unarmed part	Considerably shorter than proximal rows of teeth – their ratio being 1 : 2 to 4 : 50	Equal or mostly longer than the length of the proximal rows of teeth – their ratio being 1 : 0.33 to 1.0 (as per Schenkel)
Subapical teeth	1 to 4, (mostly 1 or 2)	Mostly 1, rarely 2
Eggs (length)	0.42 to 0.49 mm	0.33 to 0.40mm

However, Kemp (1915, 1918) studied these two varieties and concluded that the two varieties are nothing but the same.

Bouvier (1925) observed that dactylus/propodus radio of 5th pereiopod is rarely greater than 0.25 in *bengalensis* and atleast equal to 0.25 in *gracilips*. But de Man's (1908 a & 1908 b) observation of these ratios in their cotypes are 0.30 to 0.35 (Bouviers ratio being 0.18 to 0.20) and 0.26 to 0.27 respectively. Later Johnson (1963) synonymised, *gracilips* (Kemp 1918), *bengalensis* (de Man 1908b, Kemp 1915) to *C.simoni*. However *simoni* differs from the two varieties in not possessing a subapival tooth. Johnson (1963) synonymised de Man (1892, 1908b) *gracilips* with *wyckii*. But *wyckii* is distince from *gracilipes* in possessing 2 or 3 spines on the dorsal margin of the telson and a longer dactylus on the walking legs.

In recent years, Ravindranath (1977) studied the *Caridina* of Andra Pradesh. He (1977) synonymised var. gracilipes with var. *bengalensis*. He gave full species status to var. *bengalensis* on the basis of de Man's (1908b) observation that "all varieties living on the Indian Archipelago and Bengal are certainly distinct from those occurring in Africa" He stated that *C.bengalensis* of Andra Pradesh differed from those of Z.S.I. type material in possessing an *appendix interna* on the first pleopod males. From Madras Richard (1983) collected and described *C.bengalensis* and concluded that *C.bengalensis* and *C.gracilipes* are nothing but synonyms. However she did not fail to emphasis the fact that in the type material of *C.n.*var. *bengalensis* of de Man (1908b) Reg. No. 5615 – 7/10, the male did not possess an *appendix interna* on the first pleopod. But she neglected this major difference on the basis that, compared to the Madras material the males of the Z.S.I. material were small. Later she with Chandran (1994) described the Atyidae of Madras. She (1994) contented to call the Madras material as *C.gracilipes* giving importance to the senior name.

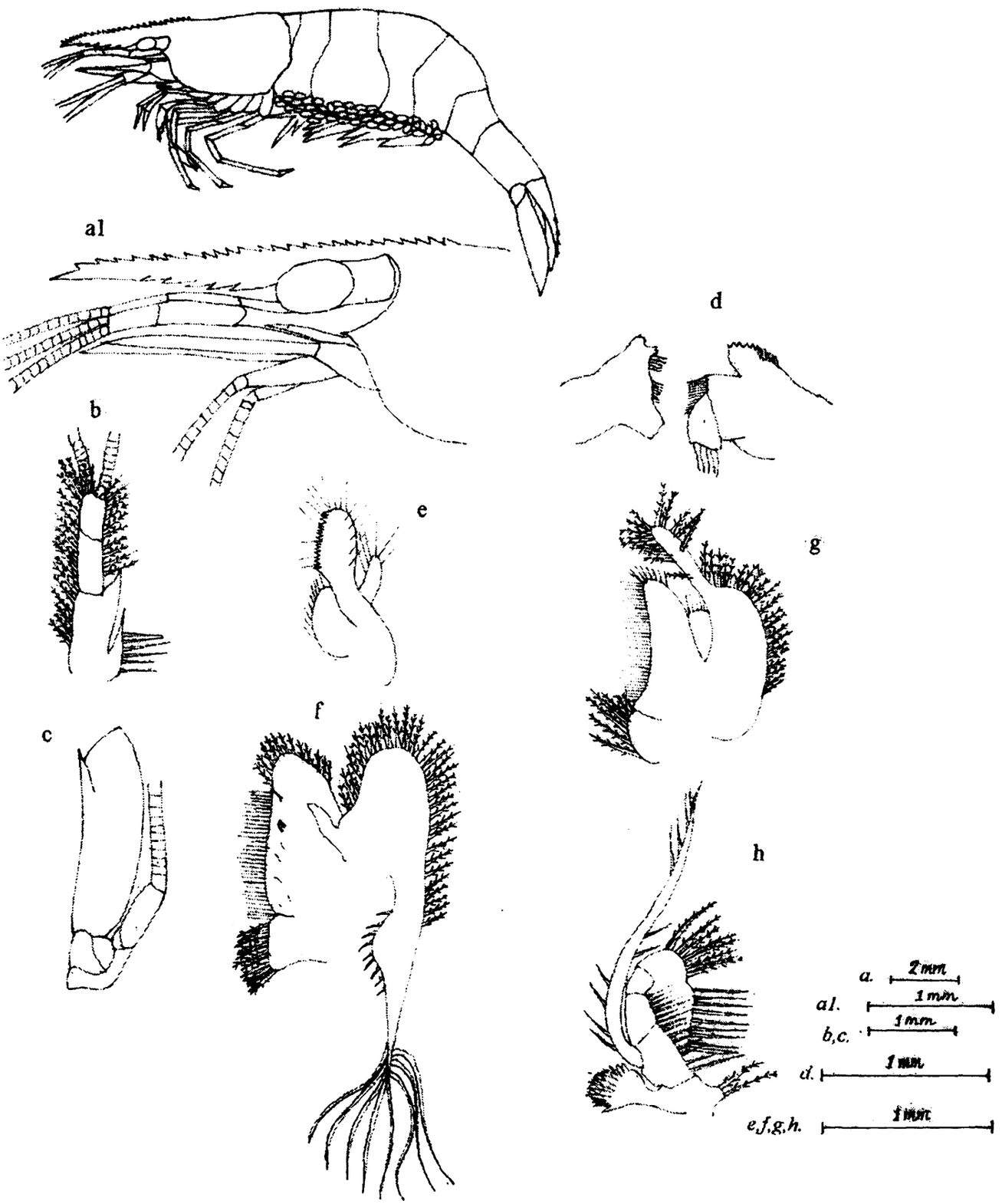

Fig - 12 ***Caridina williamsoni***

In the present study both *C.gracilipes* and *C.bengalensis* were collected.

As insisted by all carcinologists who dealt with these two forms (de Man 1892, 1908a, 1908b, Kemp 1915, 1918a, Bouvier 1925, Johnson 1963, Ravindranath 1977, Richard 1983, Richard and Chandran 1994) the morphological characters are greatly overlapping. But in *C.bengalensis* adult males never possess an *appendix interna* on the first pleopod of males as is seen in the type material from Port Canning. *C.bengalensis* of Chengalpattu District conforms with all the morphometric characters as well as in the absence of *appendix interna* on the first pleopod od adult males. *C.gracilipes* of Madras & Chengalpattu, a well defined *appendix interna* is present on the first pleopod of the males. No attention was paid to *appendix interna* until Gordon (1933) raised doubts about the validity of this organ. As de Man (1908b) did not describe this character, and as the order characters are overlapping, confusion existed in identifying *C.bengalensis* from *C.gracilirostris.* It may be insisted that the widely distributed Indian forms occuring in freshwaters is *C.gracilipes* while *C.bengalensis* is found in small brakish water ponds.

These two forms Chengalpattu District were sent to the great carcinologist of our times Dr. L.B.Holthuis, seeking his taxonomical opinion, he stated that "If the presence or absence of this appendix proves to be reliable and constant character in fully adult specimens, one could distinguish between *C.gracilipes* and *C.bengalensis*" (Personal communication dated 26.9.1993). Having this remark in mind, both *C.bengalensis* and *C.gracilipes* were collected during various seasons of 3 years and examined for the presence of *appendix interna* on the first male pleopod. It is observed that *appendix interna* of *C.gracilipes* appears in the males. 15 mm to 18 mm size and is maintained for the rest of their lives. In *C.bengalensis* it never appears.

Thus it may be insisted de Man's (1908b) observation, that his then new variety *bengalensis* is distinct from var. *gracilipes* and is valid. de Man's (1892, 1908b) *C.gracilipes* and *C.bengalensis* thus are two distinct species, while most characters overlap the males of *C.gracilipes* differ from that of *C.bengalensis* in possessing a well defined *appendix interna* on the first pleopod. Both the forms occur in the Indian subcontinent, while *C.gracilipes* enjoys wide distribution *C.bengalensis* occupies the brakish water pond not far from the sea.

4. ***Caridina williamsoni*** Jalihal *et al.*, 1984.
(Fig. 12–14)

1984. *Caridina williamsoni* Jalihal *et al., Rec. zool. Surv : India. Occ.paper* No. **69** : 1

Material Examined : 30 males (14 to 21 mm), 20 non berried females (15 to 22 mm), 15 berried females (18 to 28 mm) collected from River Arani at Arani, Periapalayam, Ponneri and Puduvoli, River Cheyyar at Magaral. Lake at Thenneri. Ponds Poovalambedu and Sathyavedu.

Z.S.I. No A/C : 4

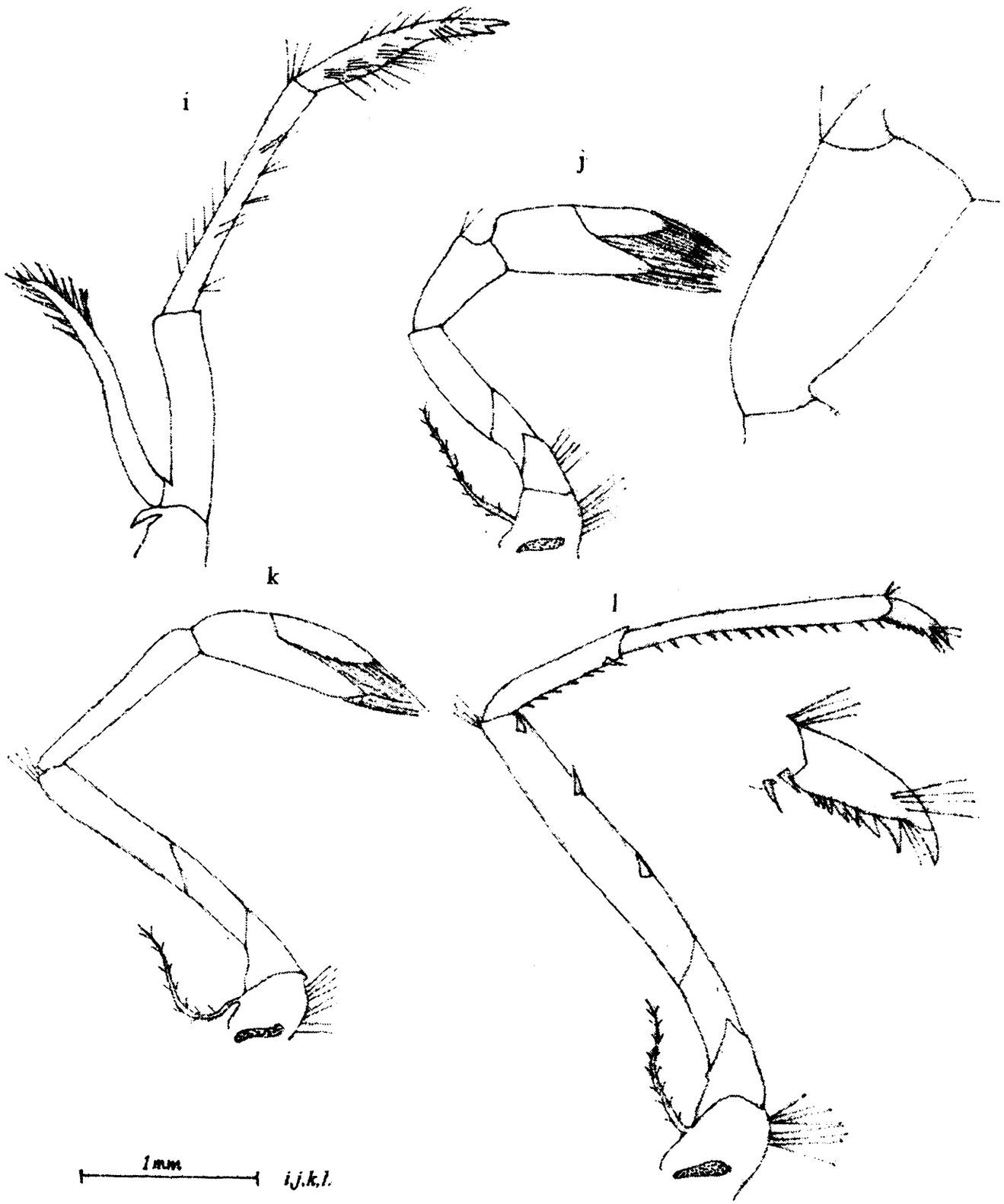

Fig - 13 ***Caridina williamsoni***

Diagnosis : Maximum size about 28 mm. A dorsal hump on the 3rd abdominal segment. Rostrum with the dorsal straight and lower slanting margin, presents a dagger like appearance. Rostrum always longer than antennular peduncle slightly over-reaching antennal scale.

Rostral formula $\frac{20 - 46}{5 - 15}$ (mostly $\frac{25 - 45}{6 - 13}$) with 2 to 4 (mostly 3 or 4) postorbitals.

Teeth on the dorsal margin uniformly distributed upto the tip without any gap. Ventral teeth are longer than the dorsal and arranged equidistantly leaving a small gap at the tip. Carapace without pterygostomial spine. Antennal spines well developed. Antennular peduncle about 0.5 to 1.00 times the carapace. Carpus of the first cheliped without any excavation and 2.0 to 2.8 times as long as broad. Carpus of the second cheliped without any excavation and 4.96 to 6.0 times as long as its breadth. Propodus of the third pereiopod 3.78 to 5.60 times the dactylus. Dactylus is 2.70 to 3.52 times as long as its breadth. Fifth pereiopod with propodus 3.60 to 4.39 times its dactylus. Dactylus is 2.70 to 4.68 times as long as its breadth. First pleopod of male with a well developed *appendix interna.* Preanal carina small blunt, without any spine. Posterior margin of the telson with 6 to 8 plumose processes. Uropod duaeresis with 10 to 14 (mostly 12 or 14) spinules. Eggs small and measures 0.32 to 0.48 x 0.50 to 0.65 mm, number varying from 185 to 320. Larval development prolonged with 6 larval stages before the post larva.

Description

Rostrum (Fig. 12,a,a1) : Rostrum with the dorsal straight and lower slanting margin, presents a dagger like appearance. Rostrum always longer than antennular peduncle slightly over-reaching antennular scale.

Rostral formula $\frac{20 - 46}{5 - 15}$ (mostly $\frac{25 - 45}{6 - 13}$) with 2 to 4 (mostly 3 or 4) postorbitals.

Teeth on the dorsal margin uniformly distributed upto the tip without any gap. Ventral teeth are larger than the dorsal and arranged equidistantly leaving a small gap at the tip.

Carapace (Fig. 12,a) : Without pterygostomial spines, antennal spine well developed. Proportion of the rostrum to that of carapace is 0.8 to 1.4.

Antennule (Fig. 12,b) : Peduncle about 0.40 to 1.0 times as long as carapace. Stylocerite reaches about 1/2 of the basal segment. Anterolateral teeth of the basal segment well produced and is 1/3rd of the 2nd segment. The aesthetasc bearing segments differ in male and female, being 25-35 in the males and 10-20 in the females.

Antenna (Fig. 12,c) : Scale about 3.35 to 4.10 times as long as broad. Outer margin straight terminating in a strong tooth, anterior margin of the lamella is triangular and over reaches the outer terminal tooth.

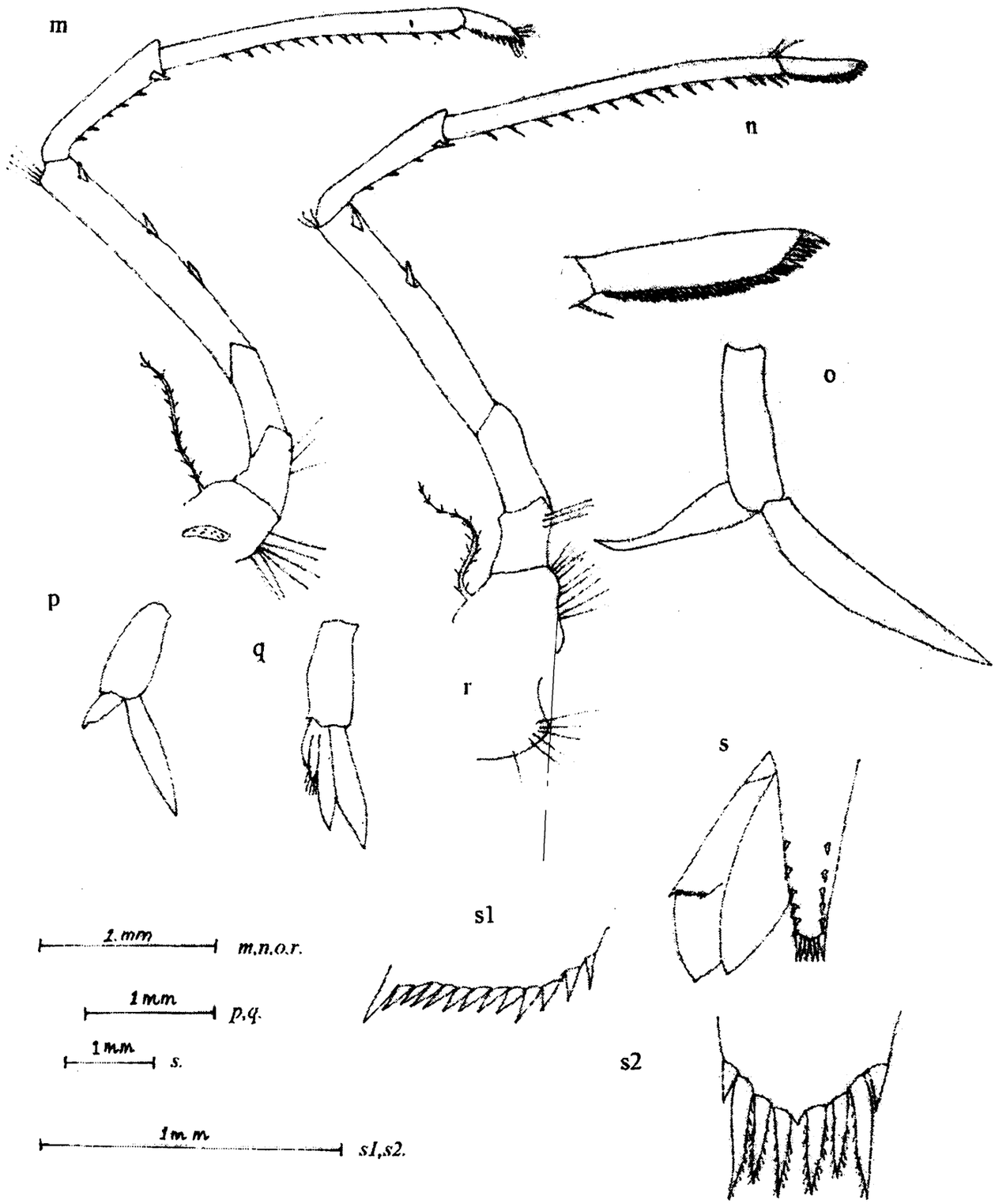

Fig - 14 ***Caridina williamsoni***

Mouth parts (Fig. 12,d to h & fig. 13,i) : Normal as figures.

Mandible (Fig. 12,d) : asymmetrical without palp.

Third maxilliped (Fig. 13,i) : with exopod and extending upto the second segment of the antennular peduncle.

First pereiopod (Fig. 13,j) : Chelate extending upto the middle of antennular peduncle. Fingers 1.10 to 1.40 times as long as palm. Chela 2.2 to 2.5 times as lonf as broad. Carpus without anterior excavation and is 2.0 to 2.8 times as long as broad.

Second pereiopod (Fig. 13,k) : Chelate, slender than first, extending beyond the antennular scale. Fingers with brushes of hair, 1.07 to 1.68 times as long as the palm. Chela 2.4 to 3.4 times as long as broad. Carpus 4.96 to 6.0 times as long as broad.

Third pereiopod (Fig. 13,l) : Dactylus 2.70 to 3.52 times as long as broad with 7 to 9 spines (mostly 8) on the posterior margin. Propodus 10.12 to 11.23 times as long as broad and bears small spinules on its posterior margin. It is 3.78 to 5.60 times the dactylus and 0.35 to 0.48 times the carapace. Carpus with a subterminal spine and a row of small spines and measures about 0.55 to 0.65 times the propodus. Merus 1.7 to 2.3 times the carpus and 3 or 4 stout spines on the posterior margin. Ischium much smaller in size with a big spine on the posterior margin.

Fourth pereiopod (Fig. 14,m) : Much slender and is similar to the third. Epipod present on all the first 4 pereiopods.

Fifth pereiopod (Fig. 14,n) : Dactylus 2.70 to 4.68 times the breadth and bears 35 to 56 spinules on the posterior margin and gives a comb like appearance. Propodus 10.38 to 15.60 times as long as broad and bears a row of spinules on its inner margin. It is 3.60 to 4.39 times the dactylus and 0.34 to 0.61 times the carapace. Carpus bears a subterminal spine and a row of small spines on its posterior margin. Carpus 0.40 to 0.55 times the propodus. Merus 1.4 to 1.7 times the carpus and bears 2 to 4 stout spines on the posterior margin. Ischium unarmed 1 or 2 setobranches present on the coxa of all pereiopods.

Abdomen (Fig. 12,a) : With dorsal hump on the 3rd segment. Sixth segment 0.40 to 0.70 times as long as the carapace.

Firdt pleopod (Fig. 14,o) : The first pleopod of female without *appendix interna* and the endopod measuring 0.5 to 0.6 times the exopod and 3.70 to 4.3 times as long as its breadth. In endopod in male (Fig. 14,p) possesses a distinct *appendix interna* 0.35 to 0.52 times the exopod and 1.68 to 2.57 times as long as its breadth.

Second male pleopod (Fig. 14,q) : Possesses appendix masculina which is 0.38 to 0.65 times as long as endopod and 1.20 to 2.10 times the *appendix interna.*

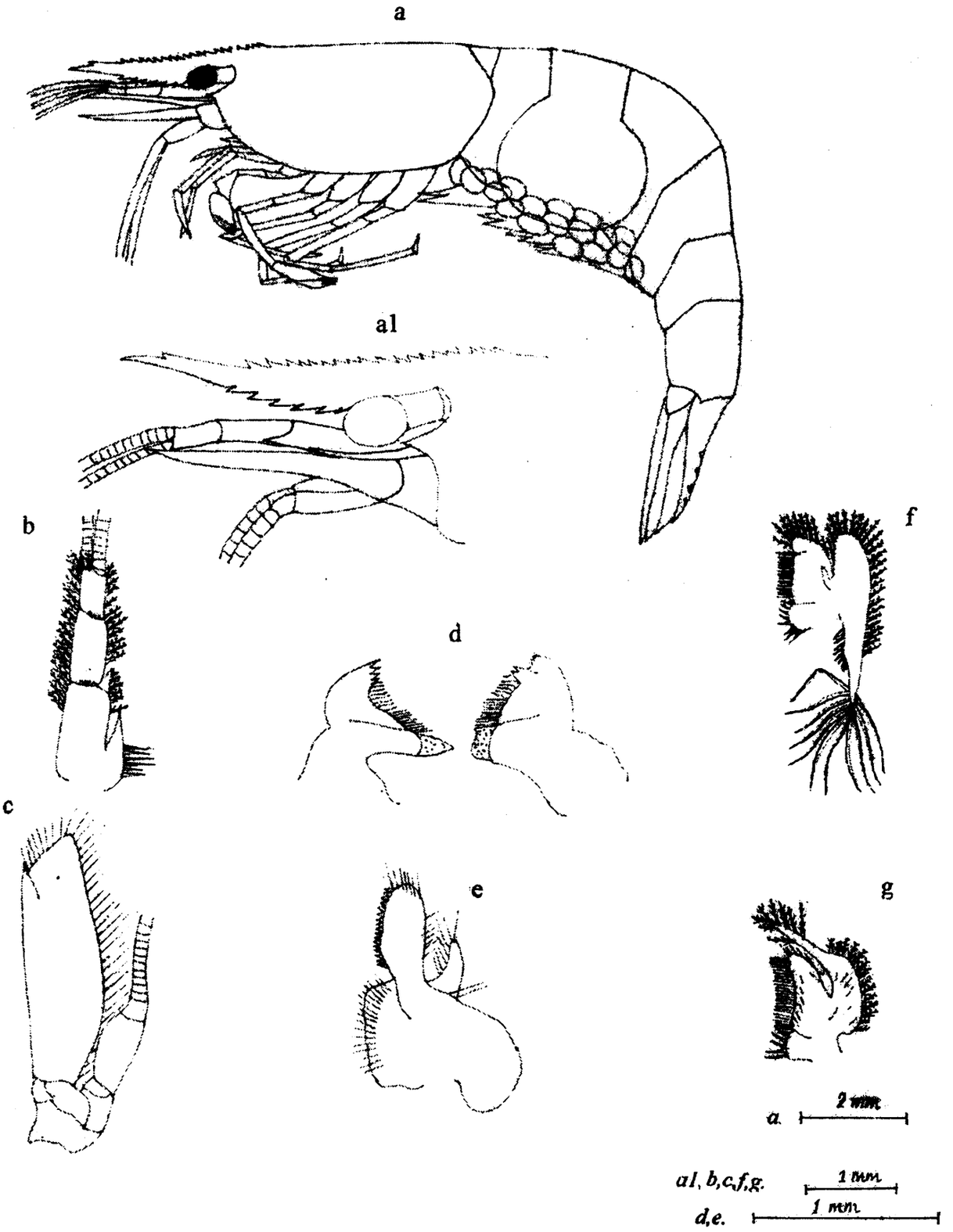

Fig - 15 ***Caridina kunnathurensis***

Preanal carina (Fig. 14,r) : Small, blunt, without any spine but with a few small hairs.

Telson (Fig. 14,s & s2) : With 4 or 6 (mostly 5) pairs of dorsal spines. Posterior margin with a small distinct triangular median point and bearing 6 to 8 long, broad; Plumose setae, outermost being longest and stoutest plumose only on inner margin.

Uropod (Fig. 14,s & s1) : 10 to 14 (mostly 12 or 13) spinules on diaeresis.

Eggs and development : Eggs small, greenish brown in colour, measuring 0.30 to 0.48 x 0.50 to 0.65 mm. Fecundity 185 to 320. Development is prolonged, consisting of 6 larval + 1 postlarval stages when reared in laboratory.

Colour in live condition : The colour pattern described by Jalihal *et al,* 1984 is not observed in the present collection. The prawns were slightly brownish on collection and turned pale when kept in aquaria.

Discussion

C. williamsoni Jalihal *et al.,* 1984.

Jalihal erected this new species in 1984; which he collected from impounded freshwater bodies in and around Dharwar, Malaprabha river and Khanapur (Belgaum District), Karnataka.

While erecting this new species, he realised, the similarity of this species to *C.rajadhari.* Jalihal (1984) clearly distinguished his new species from *C.rajadhari,* by the presence of a median spine at the tip of the telson, and by the stouter and shorter *appendix interna.* He (1984) further confirmed the validity of his new species by comparing the larval morphometric measurements with the larvae of *C.rajadhari* described by Ravindranath (1981) and Almelkar (1983) and enumerated many differences in development.

The present material collected from River Arani at Arani, Periapalayam, Ponneri, Puduvoli, River Cheyyar at Magaral and ponds at Poovalambedu and Sathayavedu of Chengalpattu District, conforms to *C. williamsoni* and the comparative measurements is presented in table No : 3.

This is the first report of this species from Tamil Nadu and also from any part of India other than Karnataka.

5. *Caridina kunnathurensis* Richard and Chandran 1994
(Fig : 15-17)

1994. *Cardina kunnathurensis* Richard and Chandran *J.Bombay Nat. Hist. Soc;* Vol. 91, No.2 : 242–259.

Material Examined : 400 males (16 to 27mm), 300 non berried females (17 to 28mm) and 300 berried female (18 to 32mm) collected from the freshwater from River Arani at

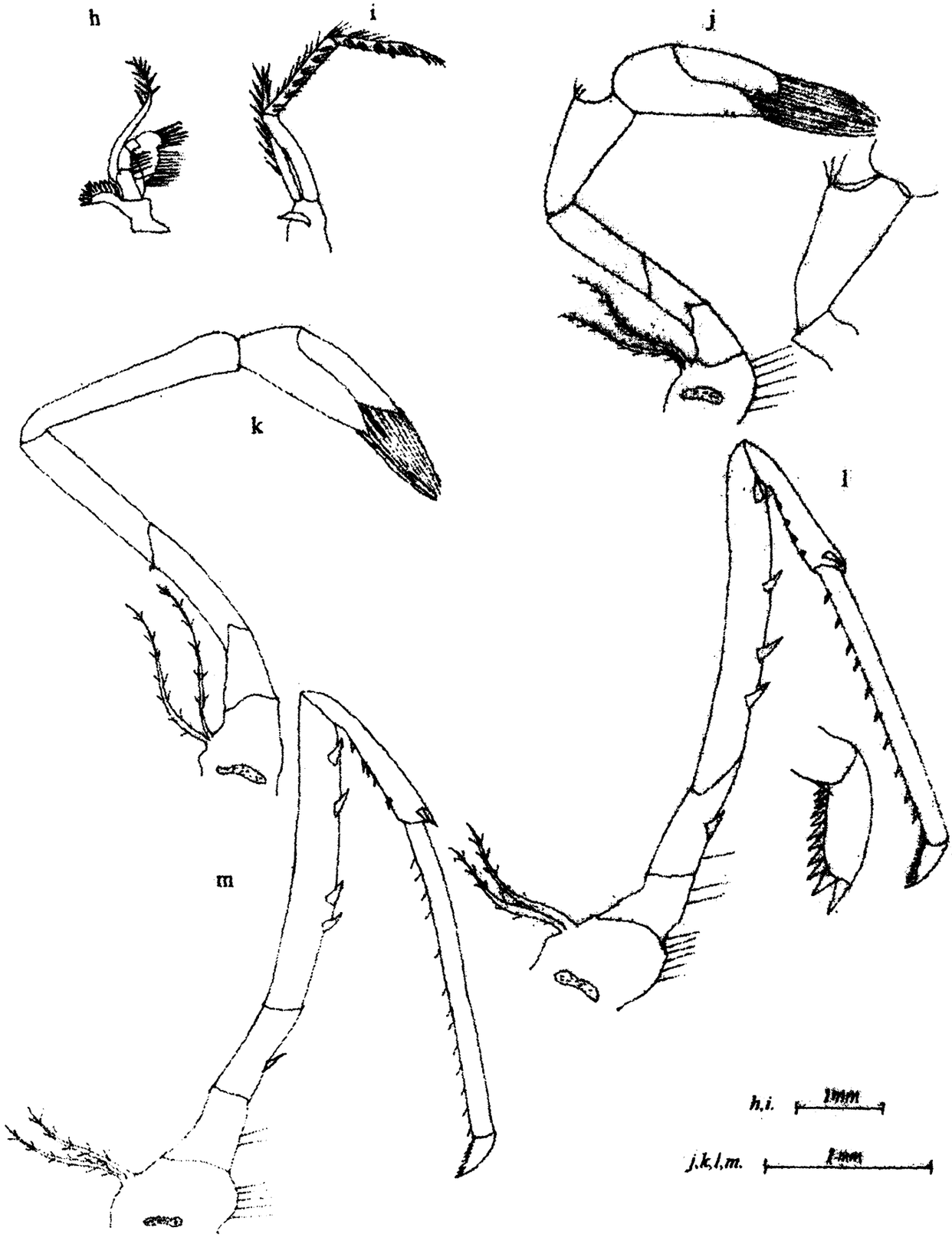

Fig - 16 ***Caridina kunnathurensis***

Arani, Periapalayam, Ponneri and Puduvoli, River Cheyyar at Magaral, River Coovam at Aranvoli, , Maduravoli, Thandari and Thiruvallur, River Koratalaiyar at Damarapakkam, Janappan Chatram and Naapalayam, River Pallar at Vallipuram and Walajabad. Lakes at Chembarambakkam, Chengalpattu, Mathurantakam, Poondi, Solwaram, Thenneri and Uthiramerur. Ponds at Anupambattu, Cheyyur, Chengalpattu, Gummidipundi, Kunnathur, Madarpakkam, Maduramangalam, Manimangalam. Mammandoor, Manivakkam, Nursery pond – Chembarambakkam. Orgadam, Padapai, pallipattu, Perichalapuram, Peruvoli, Poovalambedu, Redipalayam, RoshanNagar, Sathyavedu, Serrapanajeri, Singaperumal koli, Sriperumbudur, SRM nagar, Thirupalaivanam, Uthirsmerur, Vallam, Vattambakkam, Vedanthangal, Vepambattu.

Z.S.I. No. A/C : 5

Diagnosis : Maximum size about 32 mm. A dorsal hump on the 3rd abdominal segment. Rostrum slightly upturned distally, equal to or slightly longer than antennal scale.

Rostral formula $\frac{15 - 30}{6 - 16}$ (mostly $\frac{21 - 24}{6 - 13}$) with 3 to 5 (mostly 4) postorbitals.

Dorsal margin of rostrum with a distal gap which in many cases interrupted by 1–6 teeth. Carapace without pterygostomial spine. Antennal spines distinct with orbital expansion. Antennular peduncle about 0.45 to 0.80 times the carapace. Carpus of the first cheliped with a slight anterior excavation and 2.31 to 3.70 times as long as broad while that of second without any excavation and 3.97 to 5.6 times as long as its breadth. Propodus of the third pereiopod 3.10 to 5.95 times the dactylus. The dactylus which is in turn 10.4 to 14.8 times as long as its breadth. Fifth pereiopod with propodus 3.2 to 4.91 times its dactylus. Dactylus is 4.10 to 6.82 times as long as its breadth. First pleopod of male with a well developed *appendix interna* over-reaching the endopod. Preanal carina small, blunt without any spine. Posterior margin of the telson with 4 to 5 pairs of plumose processes, all of which are almost same length. Uropod diaeresis with 10 to 12 (mostly 11) spinules. Eggs fairly big 0.45 to 0.60 x 0.70 to 1.00 mm, ang less number varying from 50 to 150. Larval development partially abbreviated with 3 larval stages before the post larva.

Description

Rostrum (Fig. 15, a, a1) : Characteristic of the species in shape, and arrangement of the teeth. Slightly upturned distally, equal or slightly longer than the antennal scale.

Rostral formula $\frac{15 - 30}{6 - 16}$ (mostly $\frac{21 - 24}{6 - 13}$) with 3 to 5 (mostly 4) postorbitals.

Dorsal margin of the rostrum with a distal gap which almost always in interruped by 1–6 teeth. Ventral teeth compactly arranged so as to leave at least the distal 1/3 unarmed.

Carapace (Fig. 15,a) : Without pterygostomial spines. Antennal spine distinct with a small

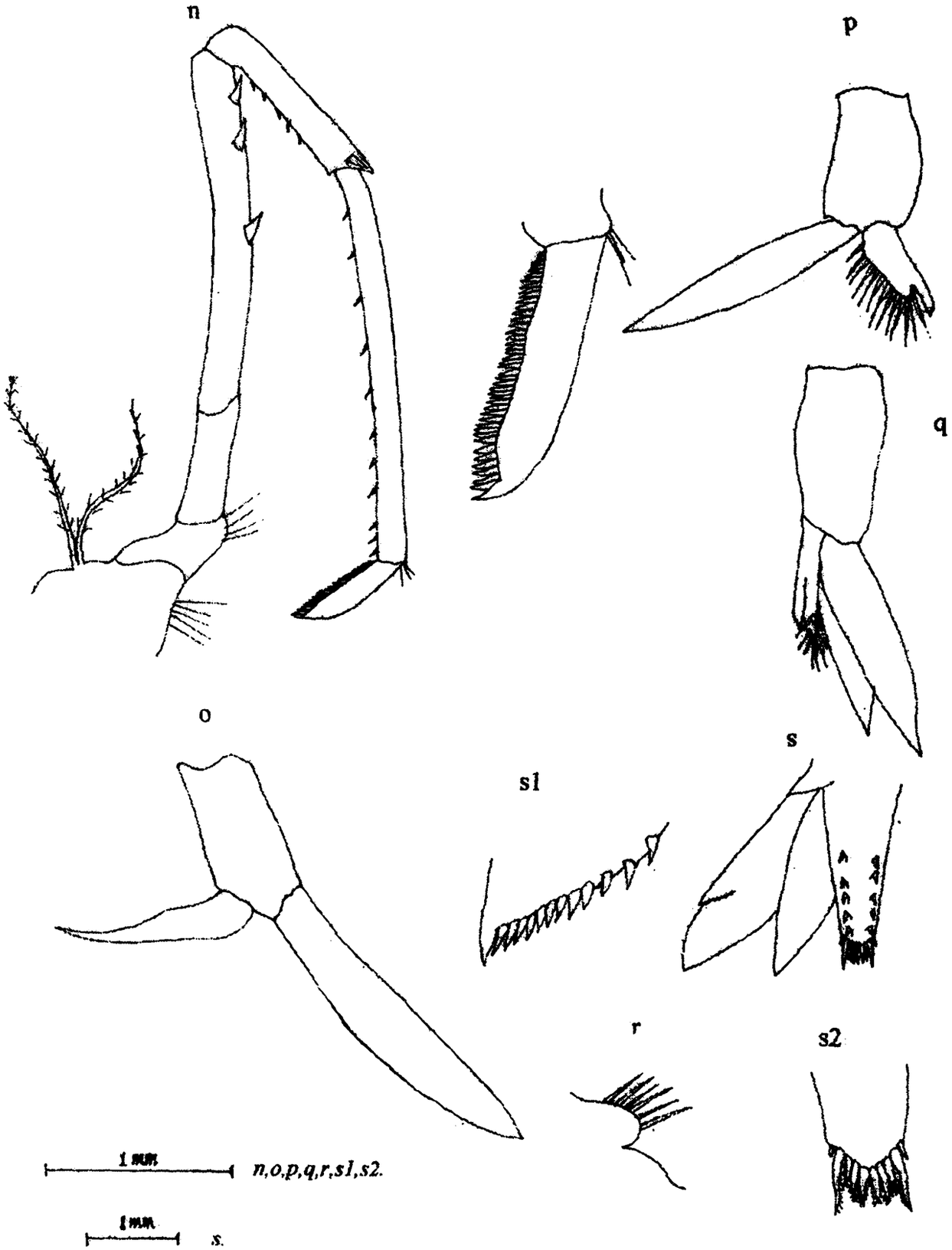

Fig - 17 ***Caridina kunnathurensis***

orbital expansion, proportion of the rostrum to that of carapace 0.70 to 1.0. Cornea rounded and well pigmented.

Antennule (Fig. 15,b) : Peduncle slender about 0.45 to 0.80 times as long as carapace. Stylocerite slender and reaches about 2/3rd of the basal segment. The anterolateral teeth of the basal segment is well produced and reaches the basal 1/3rd of the 2nd segment. Number of aesthetasc bearing segments differ in male and female, being 28 – 39 in the males and 15 – 22 in the females.

Antenna (Fig. 15,c) : Scale about 2.8 to 3.5 times as long as broad. Outer margin slightly slanting inwards and ending in a sharp spine, anterior margin of the lamella triangular and over reaches the outer terminal tooth.

Mouth parts (Fig. 15,d-g & Fig. 16,h,i) : Normal as figures.

Mandible : (Fig. 15,d) : asymmetrical without palp.

Third maxilliped : (Fig. 16,i) : extends upto the second segment of the antennular peduncle. Exopod reaching 2/3rd of the second segment of the endopod. Epipod present.

First pereiopod (Fig. 16,j) : Chelate extending upto the base of the antennular peduncle. Fingers with brushes of hairs 0.98 to 1.80 times as long as palm. Chela 2.1 to 3.2 times as long as broad. Carpus slightly excavated and 2.31 to 3.70 times as long as broad.

Second pereiopod (Fig. 16,k) : Chelate extending upto the base of the antennular peduncle. Fingers with brushes of hair, 1.10 to 2.00 times as long as the palm. Chela 2.07 to 0.92 times as long as broad. Carpus slender without excavation 3.97 to 5.60 times as long as broad.

Third pereiopod (Fig. 16,l) : Extends upto the second segment of the antennular peduncle. Dactylus 2.7 to 4.7 times as long as broad, terminates in a sharp spine distally bearing 7 to 11 (mostly 8 to 11) on the posterior margin. Propodus 10.4 to 14.3 times as long as broad and bears small spinules on its posterior margin. It is 3.40 to 5.95 times the dactylus and 0.37 to 0.48 times the carapace. Carpus with a sub-terminal spine and a row of small spines on its posterior margin, measures about 0.40 to 0.55 times the propodus. Merus 1.6 to 2.4 times the carpus and 3 to 5 stout spines on the posterior margin.

Fourth pereiopod (Fig. 16,m) : Much slender and similar to the third. Epipod present on first 4 pereiopods.

Fifth pereiopod (Fig. 17,n) : Slender and extends upto the 2nd segment of the antennular peduncle. Dactylus 4.1 to 6.82 times as long as its breadth and bears 35 to 58 spinules on the posterior margin and gives a comb like appearance. Propodus 11.70 to 16.47 times as long as broad and bears a row of spinules on its inner margin. It is 3.20 to 4.91 times the

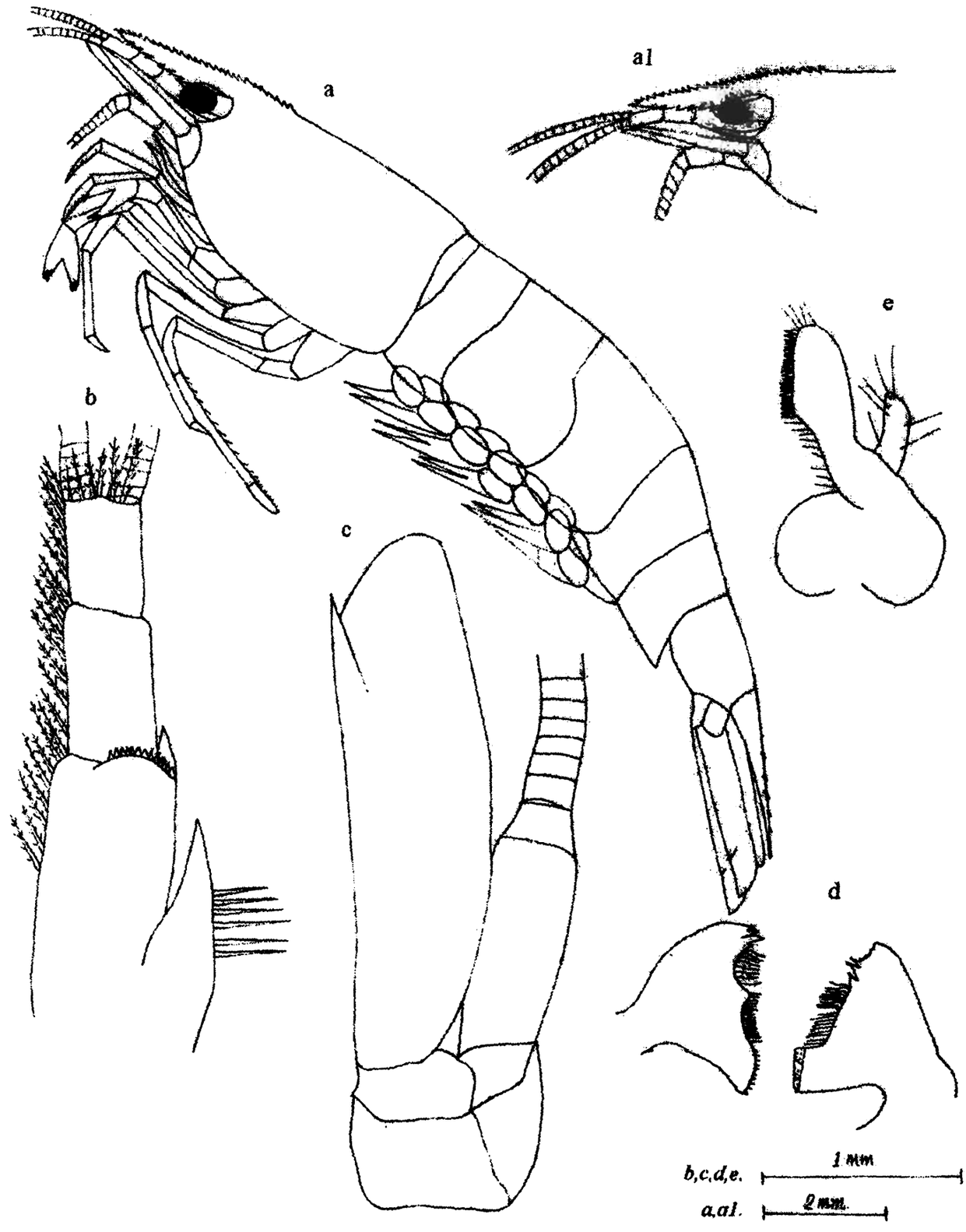

Fig - 18 ***Caridina gurneyi***

dactylus and 0.30 to 0.55 times the carapace. Carpus bears a subterminal spine and a row of small spines on its posterior margin. Carpus 0.4 to 0.6 times the propodus. Merus 1.5 to 1.8 times the carpus and bears 2 to 4 spines on the posterior margin. Ischium slendwe without a spine.

1 or 2 **setobranches** may be present on coxa of all pereiopods.

Abdomen (Fig. 15,a) : With characteristic dorsal hump on the 3rd segment. Pleura of the first three segment round while the last 3 taper towards the telson. Sixth segment 0.41 to 0.61 times as long as the carapace.

First pleopod : The first pleopod of female (fig. 17,o) without apendix interna and the endopod measuring 0.55 to 0.80 times the exopod snd 3.0 to 5.30 times as long as its breadth. The endopod in male (fig. 17,p) possesses a distinct *appendix interna* 0.28 to 0.45 times the exopod and 2.30 to 2.85 times as long as its breadth.

Second male pleopod (Fig. 17,q) : Possesses appendix masculina which is 0.30 to 0.56 times the endopod and 1.0 to 1.7 times as long as *appendix interna.*

Preanal carina (Fig 17,r) : Blunt, without any spine armed with a few setae.

Telson (Fig. 17,s & s2) : Telson tapering towards the posterior end in which it bears 4 or 5 (mostly 5) pairs plumose processes, which are almost equal in length. Telson 1.3 to 1.6 times as long as the 6th abdominal segment. The outermost is sparsely plumose on the inner side only. 4 to 6 pairs dorsal spines are present.

Uropod (Fig. 17,s & s1) : Extending well beyond the telson. The spinules on the diaeresis 10 to 12 (mostly 11 or 12).

Eggs and development : The yellowish eggs, are fairly big and less in number. Measureing 0.45 to 0.60 x 0.70 to 1.00 mm and the numbers vary from 5.-150. Development is partially abbreviated with 3 larval stages before post-larva.

Colour in live condition : The shrimps are healthy greenish in colour. Beried females are readily identified from the other species available in the same pond by the distinctly visible yellowish eggs. Chromatophores are of orange-red stellate types concentrated at the ventral margin of the rostrum, anterior and posterior margin of the carapace, at the junction of the abdominal pleura and at the anterior end of the telson.

Discussion

C.kunnathurensis, a new species was collected from a small village near Madras, by Richard 1983, while she did a fundamental study of the Atyidae of Madras.

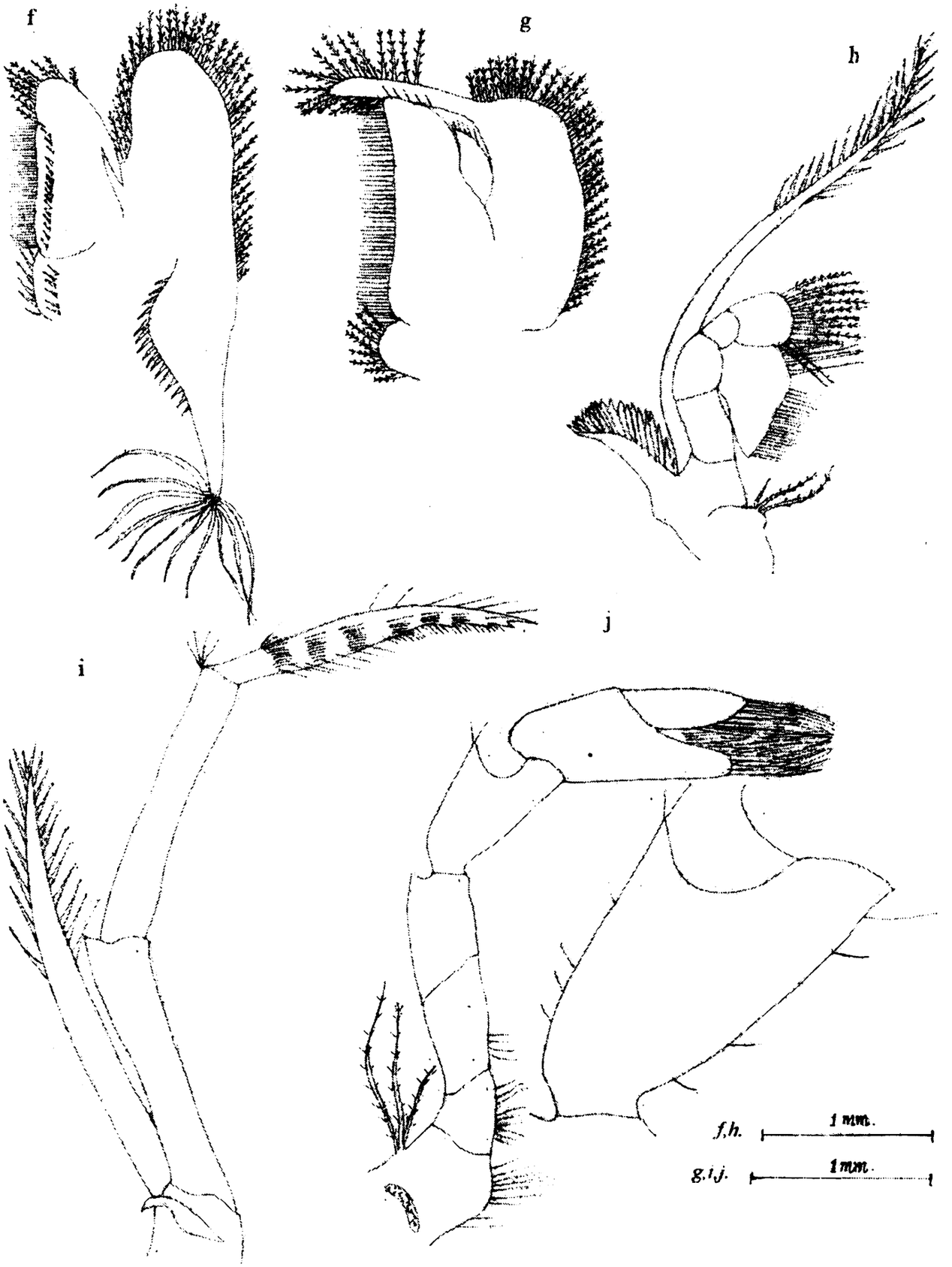

Fig - 19 ***Caridina gurneyi***

Later with Chandran, she (1994) published the same along with the *Cardina* of Madras.

Jalihal reported (personal communication with Dr. D.R.Jalihal) the same from Bangalore, Karnataka and Rathnagiri in Maharastra.

In the present study the species is found to be well distributed in 14 rivers sites, 7 lakes and 30 ponds.

A comparative account of mprphometry of the Kunnathur material and the present material is presented in Table No. 4. It conforms with the original description. (Richard and Chandran 1994).

6. ***Caridina gurneyi*** Jalihal *et al.*, 1984.
(Fig. : 18–21)

1984. *Caridina gurneyi* Jalihal *et al., Rec. Zool. Surv : India. Occ. paper* No. **69** : 29.

1994. Non *Caridina gurneyi* Richard and Chandran *J. Bombay nat. Hist. Soc;* Vol. 91, No. **2** : ppt 242-259

Material Examined : 20 males (14 to 16 mm), 25 non berried females (16 to 24 mm), 10 berried females (20 to 25 mm) collected from River Arani at Arani and Periapalayam, River Cheyyar at Magaral, River Coovam at Maduravoli and River Pallar at Walajabad. Lakes at Solawaram. Ponds at Maduramangalam, Manimangalam, Redipalayam, RoshanNagar, Singaperumal koli and Sriperumbudur.

Z.S.I. No A/C : 6

Diagnosis : Maximum size about 25 mm. No dorsal hump on the 3rd abdominal segment. Rostrum always longer than half or 3rd antennular segment, mostly reaching its tip and in few cases even extending slightly beyond it, exhibiting considerable variation in its shape and dentition.

Rostral formula $\frac{19 - 29}{5 - 9}$ (mostly $\frac{20 - 24}{5 - 7}$) with 5 to 7 (mostly 5 or 6) postorbitals.

Teeth arrangd equidistantly upto the tip without gap. Carapace without pterygostomial spine. Antennal spines well developed. Carpus of the first cheliped with deep anterior excavation and 1.45 to 1.90 times times as long as broad. Carpus of the second cheliped without any excavation and 4.18 to 6.12 times as its breadth. Propodus of the third pereiopod 3.55 to 5.10 times the dactylus. Dactylus is 2.72 to 3.40 times as long as its breadth. Fifth pereiopod with propodus 3.2 to 4.6 times its dactylus. Dactylus is 2.33 to 4.92 times as long as its breadth. First pleopod of male with a well developed *appendix interna*. Preanal carina without any spine. Posterior margin of the telson with 5 to 10 plumose hairs all of which are almost of the same length. Uropod diaeresis with 15 to 21 (mostly 16 or 17) spinules. Eggs big and measures 0.50 to 0.57 x 0.74 to 0.85 mm, number varying from 90 to 190. Larval development partially abbreviated with 3 zoeal stages before post-larva.

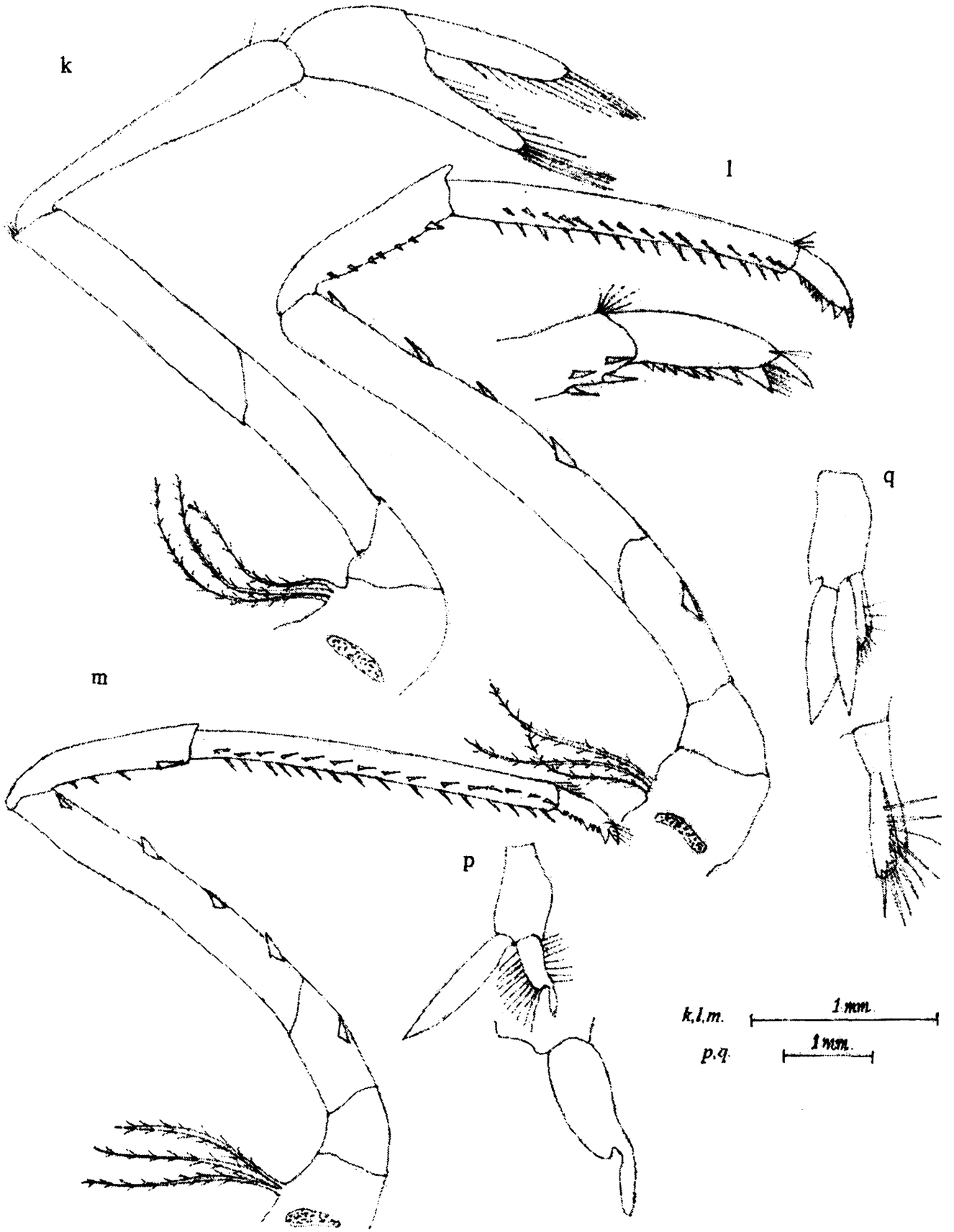

Fig - 20 ***Caridina gurneyi***

Description :

Rostrum (Fig. 18, a, a1) : Rostrum always longer than half of 3rd antennular segment, mostly reaching its tip and in few cases even extending slightly beyond it, exhibiting considerable variation in its shape and dentition.

Rostral formula $\frac{19 - 29}{5 - 9}$ (mostly $\frac{20 - 24}{5 - 7}$) with 5 to 7 (mostly 5 or 6) postorbitals.

Teeth arranged equidistantly upto tip without any gap.

Carapace (Fig. 18, a) : without pterygostomial spines, antennal spine well developed. Proportion of the rostrum to that of carapace is 0.30 to 0.55, Cornea broad and well pigmented.

Antennule (Fig. 18, b) : Peduncle short and is about 0.35 to 0.55 times as long as carapace. Stylocerite reaches about 3/4th of the basal segment. Anterolateral teeth of the basal segment is well produced and reaches the basal 1/3rd of the 2nd segment. The aesthetasc bearing segments in male and female, being 14-19 and 9-13 respectively.

Antenna (Fig. 18, c) : Scale about 3.0 to 3.7 times as long as broad. Outer margin straight terminating in a strong tooth, anterior margin of the lamella is triangular and over reaches the outer terminal tooth.

Mouth parts (Fig. 18, d, e & fig. 19, g, h, i) : Normal as in figures.

Mandible (Fig. 18, d) : asymmetrical without palp.

Third maxilliped (Fig. 19, i) : with epipod and extending upto the tip of antennular peduncle.

First pereiopod (Fig. 19, j) : Chelate extending upto the middle of antennular peduncle. Fingers 0.83 to 1.10 times as long as palm. Chela 1.86 to 2.40 times as long as broad. Carpus deeply excavated anteriorly and is 1.45 to 1.90 times as long as broad.

Second pereiopod (Fig 20, k) : Chelate, slender and extending upto the antennular peduncle. Fingers 1.13 to 1.48 times as long as the palm. Chela 1.32 to 3.20 times as long as broad. Carpus slender, without anterior excavation, 4.18 to 6.12 times as long as broad.

Third pereiopod (Fig. 20, l) : Slender and extends upto the tip of the antennular peduncle, dactylus 2.72 to 3.40 times as long as broad with 7 to 9 spines (mostly 8) spines on the posterior margin. Propodus 8.60 to 9.75 times as long as broad and 3.55 to 5.10 times long as dactylus and 0.30 to 0.45 times as long as carapace. Carpus about 0.60 to 0.75 times

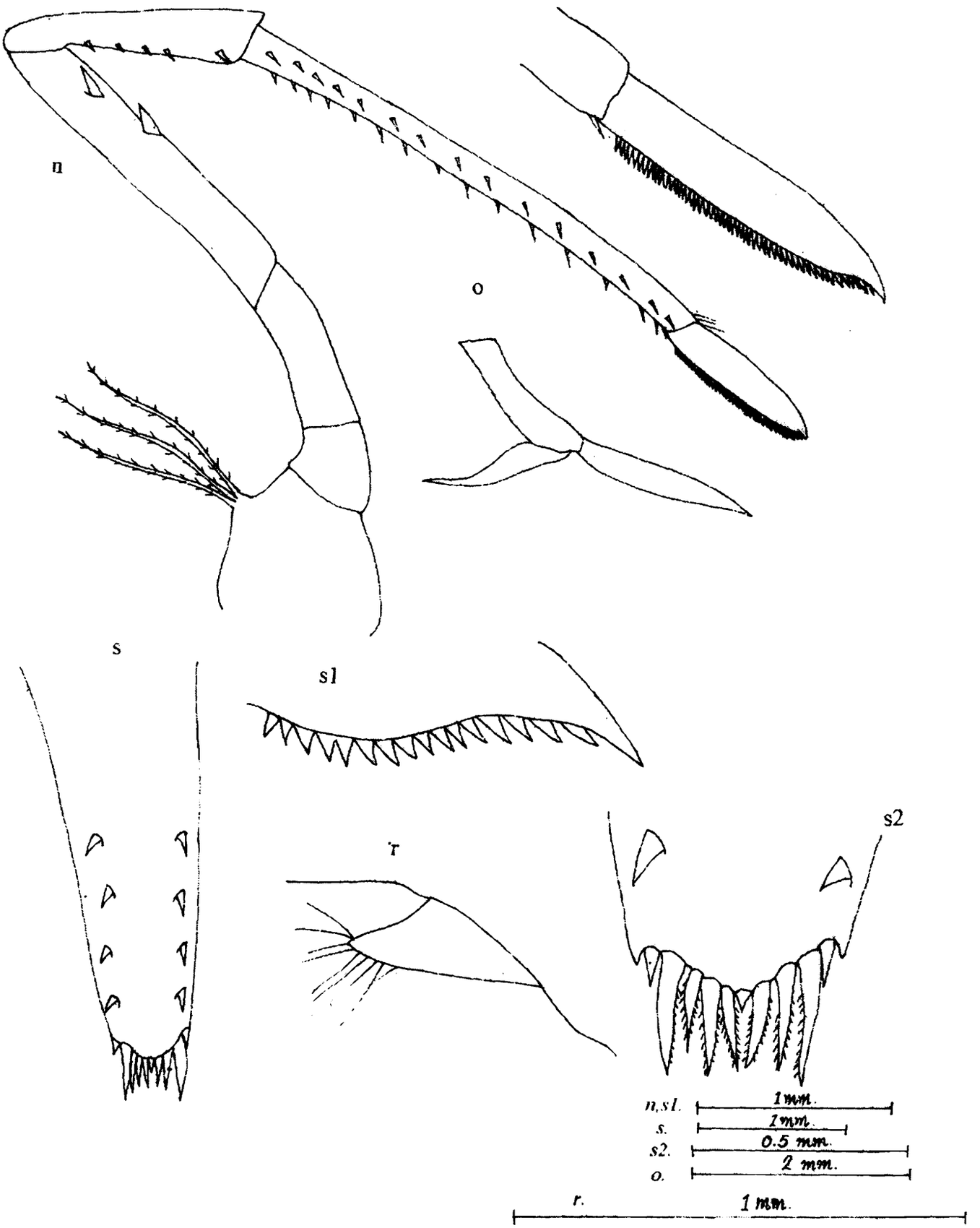

Fig - 21 ***Caridina gurneyi***

the propodus with a big subterminal spine. Merus 1.67 to 1.95 times as long as carpus, and 4 or 5 large spines o its posterior margin. Ischium with large spine on the posterior margin.

Fourth pereiopod (Fig. 20, m) : Similar to the third but without ischial spine. Epipod present on first 4 pereiopods.

Fifth pereiopod (Fig. 20, n) : Reaching tip of antennular peduncle. Dactylus 2.33 to 4.92 times as long as broad and with 31 to 50 (36 – 42) comb like spinules on the posterior margin. Propodus with 3 rows of small spinules, 9.11 to 14.60 times as long as broad and 3.10 to 4.6 times as long as dactylus and 0.34 to 0.65 times as long as carapace. Carpus with large subterminal and an inner row of small spinules and is 0.49 to 0.65 times as long as the propodus. Merus about 1.30 to 1.52 times as long as carpus and bears 2 to 3 large spines on the posterior margin. Ischium without spine. 1 or 2 setobranches are seen in all pereiopods.

Abdomen (Fig. 18, a) : Without dorsal hump on the 3rd segment. Pleura of first 3 segments rounded while the last 3 taper towards the telson. Sixth segment 0.32 to 0.44 times as long as the carapace.

First pleopod : Endopod of first pleopod of the female (Fig. 21, o) without *appendix interna*, and it measures 0.61 to 0.91 times as long as the exopod and 2.74 to 5.04 times as long as its breadth. The endopod in male (Fig. 20, p) possesses a distinct *appendix interna* measuring 0.35 to 0.59 times as long as the exopod and 1.90 to 3.35 times as long as its breadth.

Second male pleopod (Fig. 20, q) : Possesses appendix masculina which is 0.48 to 0.69 times as long as the endopod and 1.30 to 1.50 times the *appendix interna.*

Preanal carina (Fig. 21, r) : Preanal carina very distinct and pointing. Remarkable setae present at the tip.

Telson (Fig. 21, s & s2) : Dorsal surface of telson bearing 5 to 6 (mostly 6) pairs of small spines. Posterior margin with or without a sharp median point, bearing 5 to 10 long blunt, plumose spine. Posterior spines usually arranged in pairs but sometimes as an unpaired median spine present.

Uropod (Fig. 21, s & s1) : Extends well beyond the telson, the spinules on the diaeresis 15 to 21 (mostly 16 or 17).

Eggs and development : The eggs are large measuring 0.50 to 0.57 x 0.75 to 0.85 mm. Fecundity 90 to 190. Development is partially abbreviated, consisting of 3 larval + 1 postlarval stages.

Colour in live condition : Pale brown in colour.

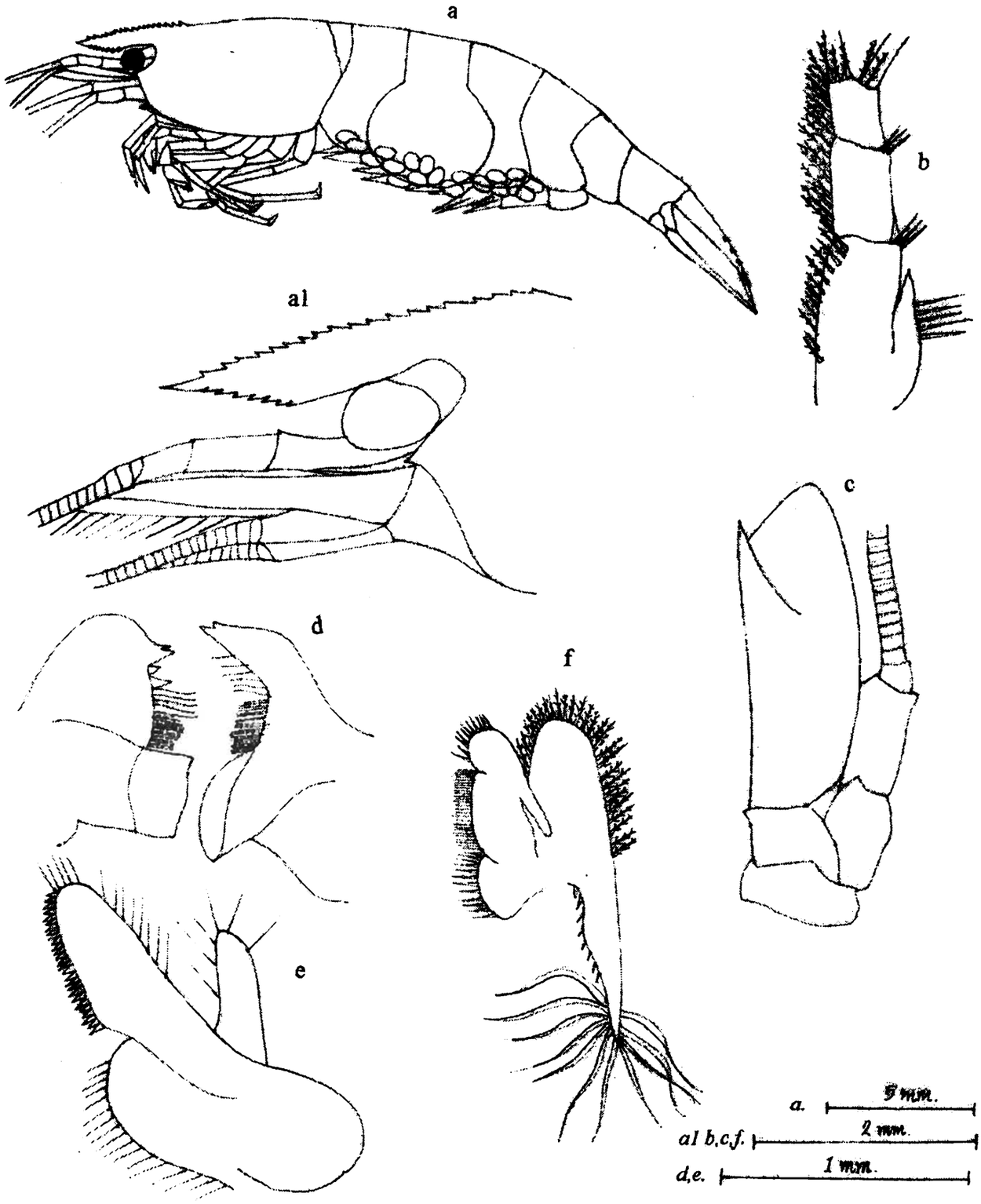

Fig - 22 *Caridina jalihali* n.sp.

Discussion

Jalihal (1978) while making a detailed study of the freshwater prawns of Dharwan area, collected a material from Malaprabha river, Khanapur and identified it as a distinct new species. Later, he with Shenoy and Sankoli (1984) established it as a new species viz. *C.gurneyi.* He differentiated *C.gurneyi from his another new species C.shenoyi* by the conspicuously bigger eggs and by the larval characters. He differentiated *C.gurneyi* from the closely resembling from viz. *C.babaulti* Bouvier (1918), *C.weberi* var. *sumatrensis* de Man (1892).

The present form, from Chengalpattu, district well conforms to that of the original description of Jalihal *et ai.,* (1984).

However it may be stated the present *C.gurneyi* of Chengalpattu district is different from *C.gurneyi lonavanenesis* from Madras (Richard 1983) and *C.gurneyi* from Madras (Richard and Chandran 1994).

Richard (1983), did a through study of the Atyidae of Madras. She (1983) collected and identified *C.gurneyi* like forms which she preferred to name *C.gurneyi lonavanensis* Almelkar 1983. She (1983) listed differences of adult and larval characters between *C.gurneyi* Jalihal 1978, and her Madras material *C.gurneyi lonavanensis* Almelkar. Later with Chandran (1994) she contented to identify her Madras material as *C.gurneyi* inspite of the variations which she promptly listed. However she (1994) was aware of the distinctness of her new species and wrote "The above differences are quite sufficient to merit a new nomenclature to the present material. However, taking into consideration our rather inadequate knowledge of this highly variable group, especially those belonging to the *Caridina weberi sumatrensis* complex, like the present one, it is desired to designate the material to *C.gurneyi* until more detailed studies are undertaken"

In the present study it was possible to collect *C.gurneyi* Jalihal *et al.,* 1984 and *C.gurneyi* of Richard and Chandran (1994). The present material is identified as *C.gurneyi* Jalihal *et al.,* 1984 and not *C.gurneyi* of Richard and Chandran (1994). The present material well conforms with the type material of Jalihal *et al.,* (1984). The morphometric measurement of *C.gurneyi* collected from chengalpattu district is compared with that of *C.gurneyi* Jalihal *et al.,* (1984) Table No.5

Apart from morphological and larval distinctions listed by Richard and Chandran (1994), in the present investigation a habitat preference could also be noticed. While *C.gurneyi* Jalihal *et al.,* 1984 could be collected from the fringe vegetation of the [pnd, *C.gurneyi* of Richard and Chandran (1994) are collected with effort from the shoveled bottom soil of the pond. Based on the morphological adult and larval characters along with ecological habitat preference, the material of Richard and Chandran (1994) is given a new nomenclature in the present study and discussed in relevant section.

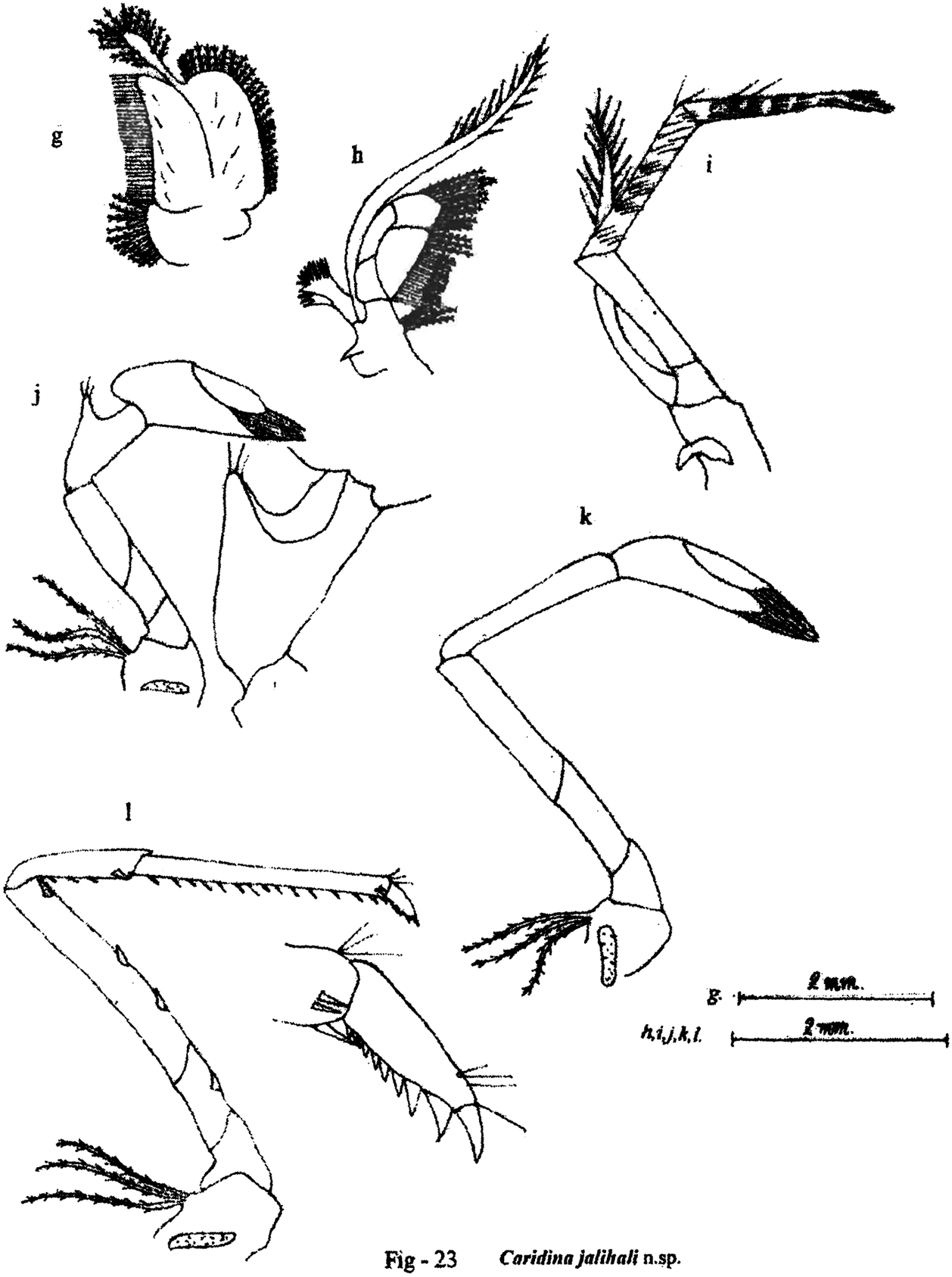

Fig - 23 *Caridina jalihali* n.sp.

7. *Caridina jalihali* n.sp.
(Fig. : 22–24)

1983. *Caridina gurneyi lonavanensis* Almelkar, *Ph.D. Thesis unpublished*

1983. *Caridina gurneyi lonavanensis* Richard, J. *Ph.D. Thesis unpublished*

1994. *Caridina gurneyi* Richard and Chandran, *J. Bombay. nat. Hist. Soc;* Vol. 191., No. 2. pp 242-259.

Material Examined : 9 males (12 to 15 mm), 8 non berried females (14 to 21 mm) and 13 berried females (20 to 29 mm) collected in the freshwater from River Arani at Periapalayam and lake at Thenneri. Ponds at Maduranmangalam, Manimangalam, Redipalayam, RoshanNagar and Singaperumal Koli.

Z.S.I. No. Holotype A/C : 7

Paratype Male A/C : 8; paratypes A/C : 9

This new species is named after Dr. D.R.Jalihal, in appreciation of his contributions towards indian carcinology.

Diagnosis : Maximum size about 29 mm. 3rd abdominal segment without hump. Rostrum slightly slanting downwards, slightly over reaching the third segment of the antennular peduncle and almost equal to the antennal scale.

Rostral formula $\frac{15 - 29}{3 - 9}$ (mostly $\frac{17 - 22}{5 - 7}$) with 3 to 6 (mostly 4 to 6) postorbitals.

Teeth arranged almost up to the tip. Carapace without pterygostomial spine. Antennal spines with a small orbital expansion. Antennular peduncle about 0.3 to 0.52 times the carapace. Carpus of the first cheliped with deep anterior excavation and 1.5 to 1.98 times as long as broad. Carpus of the second cheliped without any excavation and 4.73 to 6.40 times as long as its breadth. Propodus of the third pereiopod 3.54 to 6.10 times the dactylus. Dactylus is 2.84 to 3.42 times as long as its breadth. Fifth pereiopod with propodus 3.72 to 5.43 times its dactylus. Dactylus is 3.25 to 4.87 times as long as its breadth. First pleopod of male with a well developed *appendix interna* over reaching the endopod. Preanal carina without any spine. Posterior margin of the telson mostly with 3 to 5 plumose processes all of which are almost of the same length. Uropod diaeresis with 17 to 20 (mostly 18 or 19) spinules. Eggs big and measures 0.6 to 0.67 x 0.88 to 1.07 mm, number varying from 50 to 100. Larval development abbreviated with 3 zoeal stages before post larva.

Description :

Rostrum (Fig. 22, a, a1) : Shorter than the antennular peduncle, slightly over reaching the 3rd segment of the antennular peduncle, but not reaching the tip of it. Almost equal the antennal scale. Distal end of the rostrum slightlt slanting downwards.

Fig - 24 *Caridina jalihali* n.sp.

Rostral formula $\frac{15 - 29}{3 - 9}$ (mostly $\frac{17 - 22}{5 - 7}$) with 3 to 6 (mostly 4 or 5) postorbitals.

Teeth arranged equidistantly upto the tip without any gap.

Carapace (Fig. 22, a) : Without pterygostomial spines, antennal spine well developed with a small orbital expansion. Proportion of the rostrum to that of carapace is 0.40 to 0.58. Cornea rounded and well pigmented.

Antennule (Fig. 22, b) : Peduncle short and stoutis about 0.30 to 0.52 times as long as carapace. Stylocerite reaches about 3/4 of the basal segment. The anterolateral teeth of the basal segment well produced and is 1/4 of the middle segment. The aesthetasc bearing segments in male and female, being 30 – 44 in the males and 20 – 29 in the females.

Antenna (Fig. 22, c) : Scale short about 2.8 to 2.90 times as long as broad. Outer margin straight terminating in a strong tooth, anterior margin of the lamella is triangular and over reaches the outer terminal tooth.

Mouth parts (Fig. 22, d, e, f & fig. 23, g, h, i) : Normal as in figures.

Mandible (Fig. 22, d) : asymmetrical without palp.

Third maxilliped (Fig. 23, i) : Extends upto the tip of the antennular peduncle. Exopod reaching to the 2nd segments of the endopod. Epipod present.

First pereiopod (Fig. 23, j) : Chelate extending upto the base of antennular peduncle. Fingers with brushes of hairs 0.95 to 1.46 times as long as palm. Chela 1.5 to 2.40 times as long as broad. Carpus without deep anterior excavation and is 1.5 to 1.98 times as long as broad.

Second pereiopod (Fig. 23, k) : Chelate, slender and extending upto the antennular scale. Fingers with brushes of hair, 1.30 to 1.66 times as long as palm. Chela 2.4 to 3.50 times as long as broad. Carpus slender without anterior excavation 4.73 to 6.40 times as long as broad.

Third pereiopod (Fig. 23, l) : Slender and extending upto the tip of the antenular peduncle. Dactylus 2.84 to 3.42 times as along as broad with 8 to 10 spines (mostly 8 to 9) on the posterior margin. Propodus 8.25 to 11.00 times as long as broad and bears small spinules on its posterior margin. It is 3.54 to 6.10 times the dactylus and 0.35 to 0.70 ties as long as carapace. Carpus with a sub-terminal spine and a row of small spines and measures about 0.55 to 0.76 times the propodus. Merus 1.75 to 2.01 times the carpus and 3 or 4 stout spines. Ischium with stout spines.

Fourth pereiopod (Fig. 24, m) : Much slender and similar to the third. Epipod present on all first 4 pereiopods.

Fifth pereiopod (Fig. 24, n) : Much slender extends up to the base of the antennular prduncle. Dactylus 3.25 to 4.87 times the breadth and bears 32 to 60 spinules on the posterior margin and gives a comb like appearance. Propodus 11.3 to 13.4 times as long as broad and bears a row of spinules on the inner margin. It is 3.72 to 5.43 times the dactylus and 0.35 to 0.62 times the carapace. Carpus bears a subterminal spine and a row of small spines on its posterior margin. Carpus 0.48 to 0.51 times the propodus. Merus 1.37 to 1.62 times the carpus and bears 2 to 3 spine 3 setobranches are seen in all pereiopods (4 setobranches seen rarely).

Abdomen (Fig. 22, a) : Without a dorsal hump on the 3rd segment. Pleura of first 2 segment rounded while the last 3 taper towards the telson. Sixth segment 0.30 to 0.50 times as long as the carapace.

First pleopod :.Endopod of the first pleopod of female (Fig. 24, o) without : Endopod of the first pleopod of female (Fig. 24, o) without *appendix interna* and it measures 0.60 to 0.93 times as long as the exopod and 2.63 to 5.27 times as long as its breadth. In endopod in male (Fig. 24, p) and possesses a distince *appendix interna* 0.4 to 0.6 times the exopod and 2.59 to 3.50 times as long as its breadth.

Second male pleopod (Fig. 24,q) : Possesses appendix masculina which is 0.4 to 0.5 times the endopod and 1.40 to 2.10 times as long as the *appendix interna.*

Preanal carina (Fig. 24, r) : is not produced into a spine, instead a small projection with a few setae are seen.

Telson (Fig. 24, s & s2) : Telson is stout and is about 1.17 to 1.55 times as long as the 6th abdominal segment with 5 or 6 (mostly 5) pairs of dorsal spines. Posterior margin with 3 to 5 pairs (mostly 4 to 5) plumose processes and 4 or 5 setae. The lateral most stout spines are sparsely plumose only on inner margin.

Uropod (Fig. 24, s & s1) : Extends well beyond the telson and spinules on the diaeresis being 17 to 20 (mostly 18 or 19).

Eggs and development : Eggs brownish in colour, they are much bigger in size measuring 0.60 to 0.67 x 0.88 to 1.07 mm. Fecundity 50 to 100. Development is partially abbreviated with 3 larval before postlarva.

Colour in live condition : Steel black in colour with a distinct white mid dorsal band, extending from the base of the rostrum to the telson. In each abdominal segment diffused white cross bands are seen laterally. The dark red chromatophores are segment diffused

white cross bands are seen laterally. The dark red chromatophores are evenly distributed all over the body.

Discussion

Caridina gurneyi a new species of *Caridina* was erected by Jalihal (1984) from Karnataka. He collected this material from Malaprabha river, Khanapur.

The species resembles, *C babaulti* Bouvier (1918) and *C.weberi* var. *sumatrensis* de Man (1892).

Later, Almelkar (1983), collected and studied prawns from Lonavala near Bombay, which resembles *C.gurneyi*, but differs from it in certain characters, and erected a new subspecies *C.gurneyi lonavalensis.*

Richard (1983) while making a fundamental study of the freshwater prawns in the around Madras, collected *C.gurneyi lonavalensis.* and described the same in her Ph.D. dissertation based on the personal communication with the author.

She (1983) brought to light the major differences of the adult and the latvae of *C.gurneyi* and *C.gurneyi lonavalensis*. However, while publishing her material from Madras, (Richard and Chandran, 1994) she described *C.gurneyi lonavalensis* from Madras as *C.gurneyi* Jalihal *et al.,* 1984. But she felt the differences accounted were sufficient to erect a new species and stated, " The above differences are quite sufficient to merit a new nomenclature to the present material. However, taking into consideration our rather inadequate knowledge of this highly variable group, especially those belonging to the *Caridina weberi sumatrensis* complex, like the present one, it is desired to designate the material to *C.gurneyi* until more detailed studies are undertaken"

Fortunately, in the present study, *C.gurneyi* Jalihal *et al.,* 1984 and *C.gurneyi lonavalensis* were available in the same ponds and their ecological preference could be understood. The differences accounted by Richard (1983) in adult and larvae were confirmed in the present species also. Table No. 6 & 7.

Regarding the ecological preference, *C.gurneyi* Jalihal *et al.,* 1984 occupies the upper layers of the ponds while *C.gurneyi lonavalensis* could never be collected from the upper strata of the pond. Special attempts have to be made to collect the *C.gurneyi lonavalensis.* The net has to be inserted deep into the mud, and then taken back, care should be paid to collect the bottom soil. Then the animals have to be searched in the muddy soil. It is also noticed that they do not jump vigorously while catching like the other prawns. *C.lonavalensis* is deep black in colour while collecting. Whereas *C.gurneyi* is pale brown in colour. Even when collected from the same ponds, *C.gurneyi* is always collected from the upper strata of ponds and never black in colour.

It is suggested that, in speciation, the ecological preference may play a major role as an isolating mechanism. Hence the niche preference in the two species may be considered as a major difference and the present species may very well be raised to the level of species, as suggested earlier by Richard and Chandran (1994). The persent species is named after Dr. D.R. Jalihal appreciation of his contribution towards Indian carcinology.

Type locality : Pond at Manimangalam. Manimangalam is village situated near Tambaram. The Pond where the species where collected is neatly maintained by the village for drinking water purpose.

All these atyid shrimps described here can be easily distinguised from one another based on the following key characters.

Key to the species of the gunes *Caridina* of Chengalpattu District

1 Endopod of the first pleopod of male without *appendix interna* 2

– Endopod of the first pleopod of male with well developed *appendix interna* 3

2 Rostrum upturned, distinctly longer than antennal scale, over-reaching the same by 2/3rd of the distal end. Rostral formula $\frac{7-8}{27-37}$ mostly $\frac{7-8}{34-36}$ with 1 or 2 postorbitals. Almost the distal half of the rostrum unarmed. The tip gives a bifid look with one subterminal teeth. Setobranches 1 or 2. Uropod diaeresis with 7 to 9 spinules. Eggs small (0.26 to 0.39 x 0.49 to 0.60) and 210 to 450 in number. Larval development prolonged with 6 zoeal stages before post larva..... *C.gracilirostris* de Man, 1892

– Rostrum straight, equal or shorter than the antennal scale.

RF = $\frac{16-26}{7-16}$ mostly $\frac{18-21}{9-13}$ with 2 to 4 (mostly 3) postobtitals. Dorsal margin with a distal gap interrupted by 1 or 2 teeth present. Setobranches 2. Uropod diaersis with 9 to 11 spinules. Eggs 0.29 to 0.39 x 0.44 to 0.49 mm and 115 to 260 in number. Larval development prolonged with 7 zoeal stages before post larva .... *C.bengalensis* de Man 1908.

3. A dorsal hump on the 3rd abdominal segment..... 4

..... 6

– No dorsal hump on the 3rd segment ..

4. Rostrum equal to or slightly longer than the antennal scale 5

– Rostrum always slightly longer than the antennal scale.

– Rostral formula $\frac{20 - 46}{5 - 15}$ (mostly $\frac{25 - 45}{6 - 13}$) 3 or 4 (mostly 3 or 4) post orbitals. Teeth on the dorsal margin uiformly distributed upto the tip without any gap. Setobranches 1 or 2. Uropod diaeresis with 10 to 14 (mostly 12 or 13) spinules. Eggs 0.30 to 0.48 x 0.50 to 0.65 mm and 185 to 320 in number. Larval development prolonged consisting of zoeal stages before post larva .... *C. williamsoni* Jalihal *et al.*, 1984.

5 Dorsal margin of the rostrum armed leaving a distal gap while the ventral teeth are arranged compactly upto the tip.

– Rostral formula $\frac{12 - 28}{13 - 26}$ (mostly $\frac{16 - 24}{14 - 19}$) 1 or 2 (mostly 2) postorbitals.

Setobranches 2. Eggs smaller and more in number measuring 0.24 to 0.37 x 0.40 to 0.56 mm and the number vary from 150 to 850. Larval development prolonged with 7 zoeal stages before post larval ..... *C.gracilipes* de Man, 1892
Teeth on both dorsal and ventral margin of rostrum arranged leaving a distal gap.

– Rostral formula $\frac{15 - 30}{6 - 16}$ (mostly $\frac{21 - 24}{6 - 13}$) 3 to 5 (mostly 4) post orbitals. Setobranches. 1 or 2 Eggs big and less in number measuring 0.45 to 0.60 x 0.70 to 1.00 and 50 to 150 in number. Larval development partially abbreviated with 3 zoeal stages before post larva. ..... *C.kunnathurensis* Richard & Chandran 1994.

6 Always inhabits the fringe vegetation and never found in the muddy soil at the bottom. Females found in the muddy soil at the bottom. Females carry more number of smaller eggs measuring 0.50 to 0.57 x 0.74 to 0.85 mm and 90 to 190 in number. Larval development partially abbreviated with 3 zoeal stages before post larva. First and second pereiopods of the I zoea exhibit chelate nature..... ..... *C.gurneyi* Jalihal *et al.*, 1984.

– Always inhabits the bottom muddy soil and are never found in fringe vegetation. Females carry less number of bigger eggs measuring 0.60 to 0.67 x 0.88 to 1.07 and 50 to 100 in number. Larval development partially abbreviated with 3 zoeal stages before post larva. First and second .. pereiopods of I zoea are yet to be chelate ..... *C.jalihali* n.sp

FAMILY PALAEMONIDAE

8. ***Macrobrachium lamarrei lamarrei*** (H.Milne Edwards, 1837) (Fig. : 25–29)

1837. *Palaemon lamarrei* H. Milne Edwards, *Hist. nat. crust.*, **2** : 397

1908. *Palaemon (Eupalaemon) lamarrei* de Man, *Rec.Indian.Mus.*, **2** : 222

1910. *Palaemon lamarrei* Henderson & Matthai, *Rec. Indian. Mus.*, **5** : 301

1915. *Palaemon lamarrei* Kemp, *Mem. Indian Mus.*, **5** : 265

1949. *Palaemon lamarrei* Chopra & Tiwari, *Rec. Indian Mus.*, **45** : 214

1950. *Macrobrachium lamarrei* Holthuis, *Siboga Exped, Monogr.*, **39a**(9) : 119

1952. *Palaemon lamarrei lamarrei* Tiwari, *Ann. Mag. nat. Hist.*, **5** : 28

1956. *Palaemon lamarrei* Tiwari, *J. Bombay nat. Hist. Soc.*, **53** : 490

1961. *Non Palaemon lamarrei* Rajalakshmi, *J. Zool. Soc. India.* **13** : 320 (larvae)

1978. *Macrobrachium lamarrei* Anantha Raman *et al., Vignana Bharati,* **4**(2) : 79

1980. *Macrobrachium lamarrei* Holthuis, *F.A.O. : Fish Synopsis* No. 125, **1** : 95

1983. *Macrobrachium lamarrei lamarrei* Jalihal *et al., Proc. First All India Symp. Invert. Repr.*, 1980 : 239 (larvae)

1988. *Macrobrachium lamarrei lamarrei* Jalihal *et al., Rec. Zool. Sury. India, Occ. Paper* No. **112** : 2

Material Examined : 10 males (25 to 45 mm), 10 non berried females (30 to 50 mm), collected from River Arani at Katoor, River Korattatalayiyar at Naapalayam and River Palar at Walajabad and Vallipuram. A lake at Red Hills Thenneri ponds ay Thirupalaivanam and Manimangalam.

9 males and 8 non-berried females collected from Maravakandi dam built across Moyar river at Masinagudi while making a special collection at the dam.

Z.S.I. No. A/C – 10

Diagnosis :

Rostrum slightly upturned. Reaches or slightly over reaches the antennal scale.

Rostral formula $\frac{7\text{-}10+1 \text{ or } 1+1}{5\text{ - }8}$ (mostly $\frac{7 \text{ or } 8+1+1}{5 \text{ or } 6}$) with 1 or 2 postorbitals.

Teeth on the dorsal margin arranged uniformly living a distal gap. Which may be interrupted by one or two sub apical teeth. Sometimes the gap is not interrupted. Teeth on the lower margin arranged compactly up to the tip. Carapace 1.18 times the rostrum. The second cheliped similar in structure and measures about 1/3rd of the body length. Carpus 1.5 to 1.9 times chela and is 11.60 to 13.12 times as long as broad. The second pleopod with well

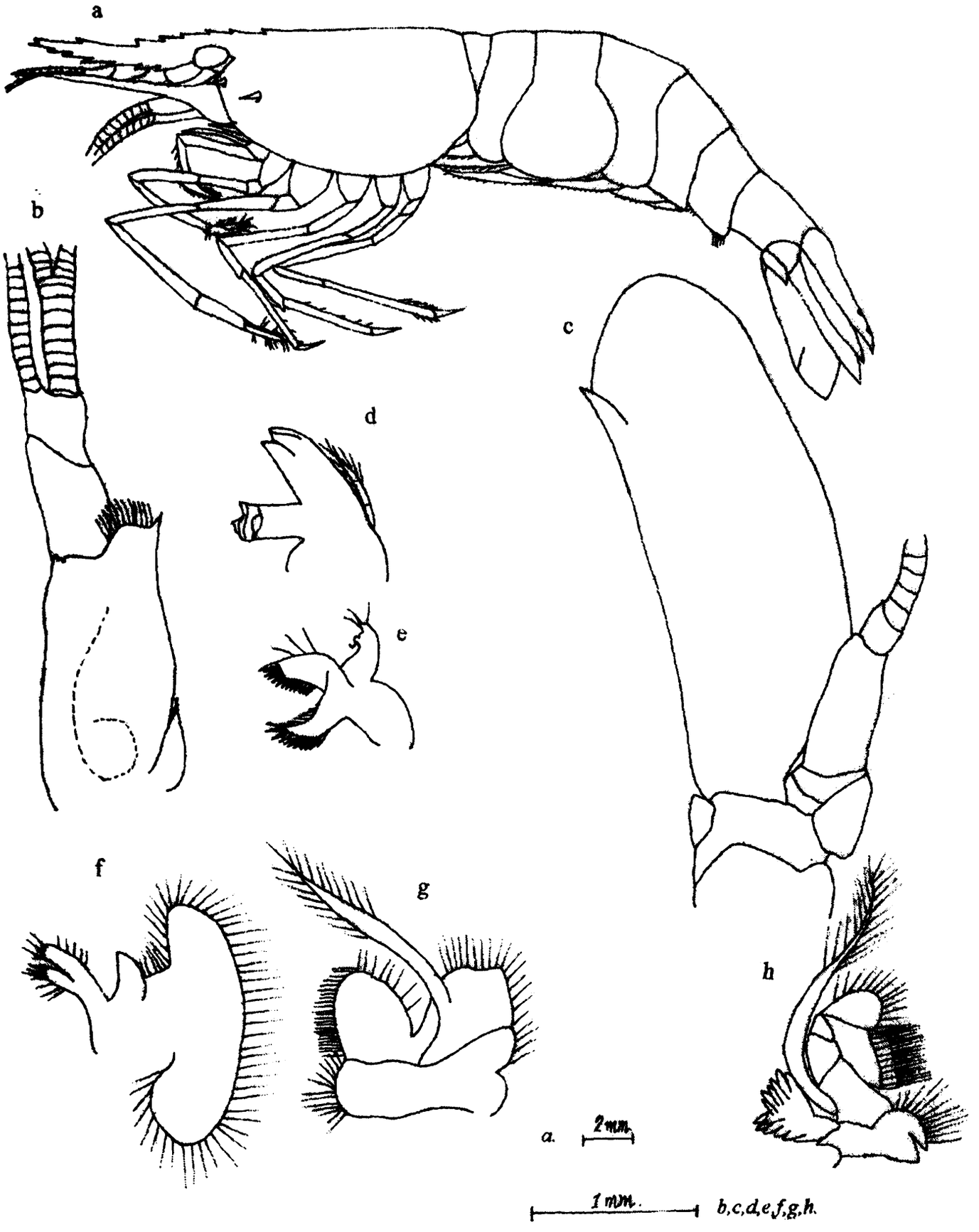

Fig - 25 ***Macrobrachium lamarrei lamarrei***

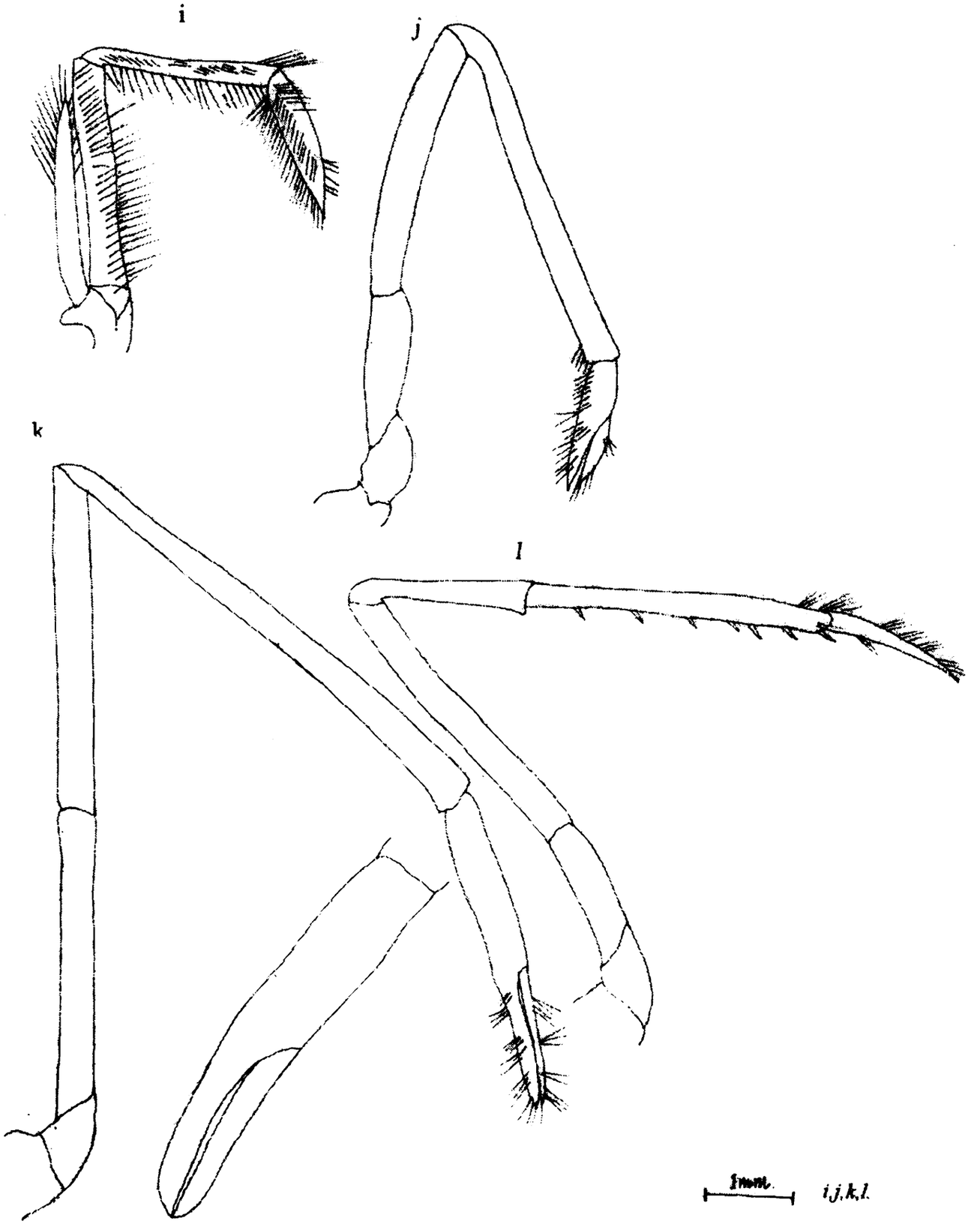

Fig - 26 ***Macrobrachium lamarrei lamarrei***

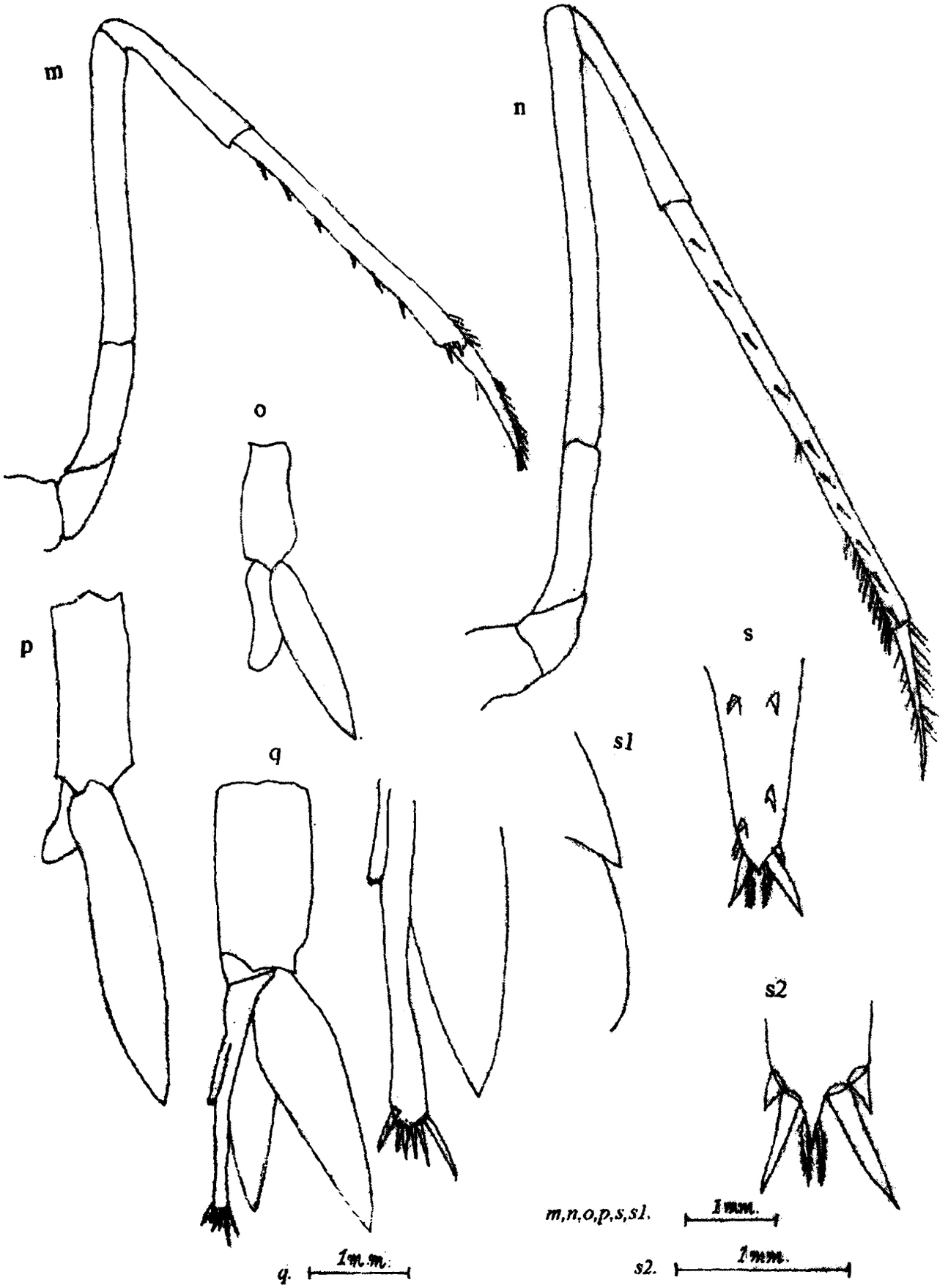

Fig.- 27 ***Macrobrachium lamarrei lamarrei***

developed appendix masculina, non hairy with few setae at the tip, long, slender, may be subequal, equal or over reaching the endopod. No subapical spines in the exopod of uropod. Telson 1.42 to 1.70 times as long as the 6th abdominal segment and with 2 pairs of dorsal and 2 pairs of posterior spines with 2 plumose setae.

Description:

Rostrum (Fig. 25, a) : Rostrum slightly upturned. Rostrum reaches or over-reaches the antennular scale.

Rostral formula $\frac{\text{7-10+1 or 1+1}}{\text{5 - 15}}$ (mostly $\frac{\text{7 or 8+1+1}}{\text{6 - 13}}$) with 1 or 2 postorbitals.

Teeth on the dorsal margin arranged uniformly leaving a distal gap which may be interrupted by one or two subapical teeth. Sometimes the gap is not interrupted by teeth. Teeth on the lower margin are arranged compactly up to the tip Proportion of the rostrum to that of carapace is 0.6 to 0.9 times. Cornea board and well pigmented. Eyes well develped.

Antennule (Fig. 25, b) : Peduncle slender and is about 0.5 to 0.7 times as long as carapace. Stylocerite being fairly long reaches the lower 1/3rd of the basal segment. Outer flagellum with 2 branches that are fused basally for 7 to 10 segments.

Antenna (Fig. 25, c) : Scale long about 2.8 to 3.2 times as long as broad. Outer margin slightly concave terminating in a strong tooth, anterior margin of the lamella rounded and over reaches the outer terminal tooth.

Mouth parts (Fig. 2, d-h & Fig. 26, i) : Normal as in figures.

Mandible (25, d) : with 3 jointed palp.

Third maxilliped (Fig. 26, i) : slender and extending upto antennal scale.

First pereiopod (Fig. 26, j) : Slender, equal and extending upto tip of antennal scale. Fingers 0.8 to 1.6 times as long as palm. Carpus 2.10 to 2.94 times as long as chela and about 0.64 to 0.88 times as long as merus.

Second pereiopod (Fig. 26, k) : Slender, equal or over reaches the antennal scale. It measures about 1/3 of the body length. Fingers 0.65 to 0.85 times as long as the palm. Carpus 1.50 to 1.90 times as long as chela and about 1.45 to 1.65 times as long as merus. Carpus 11.60 to 13.12 times as long as its breadth.

Third to fifth pereiopod (Fiog. 26, l & Fig. 27, m, n) : Similar in structure with simple dactylus.

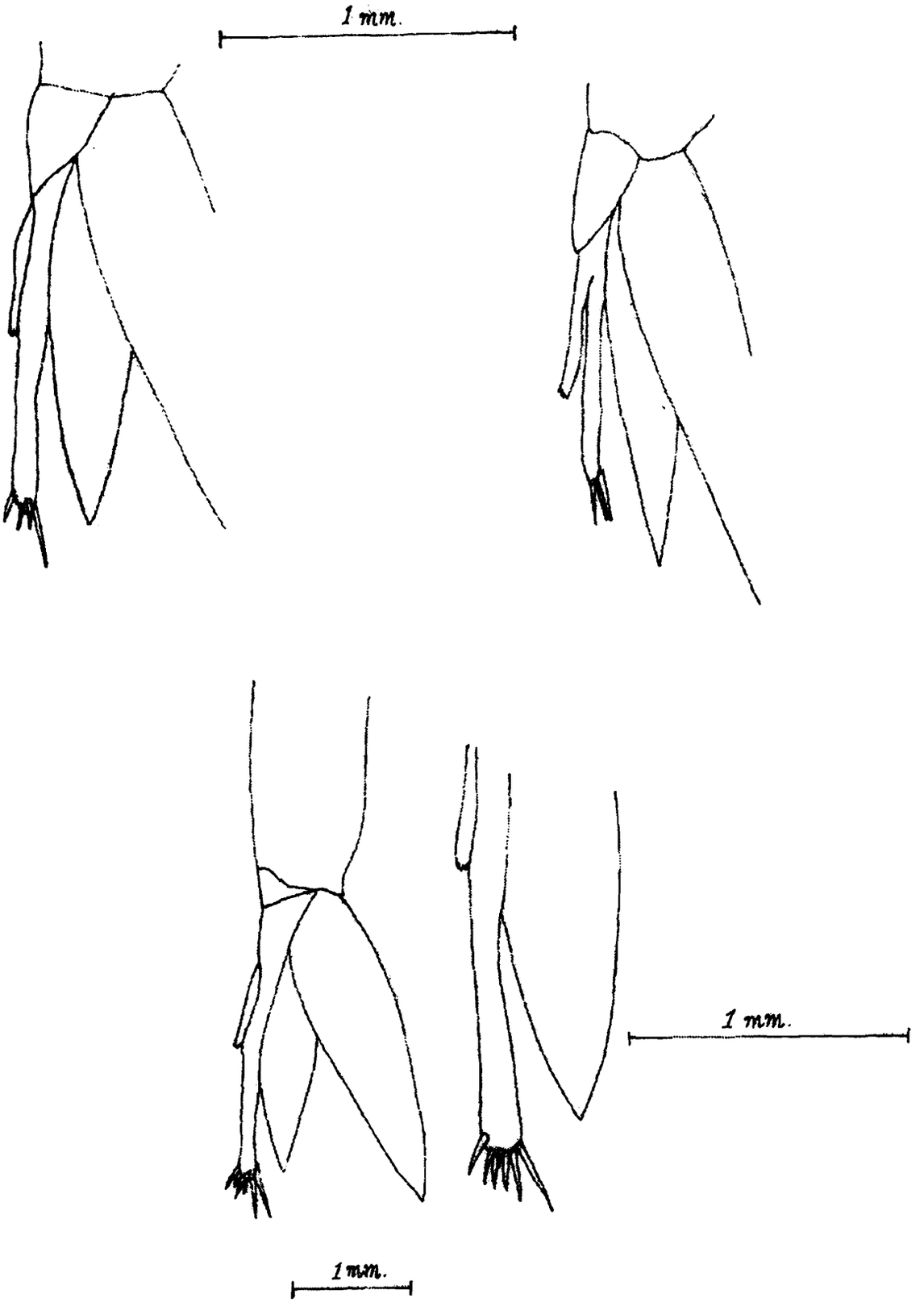

Fig - 28 ***Macrobrachium lamarrei lamarrei***

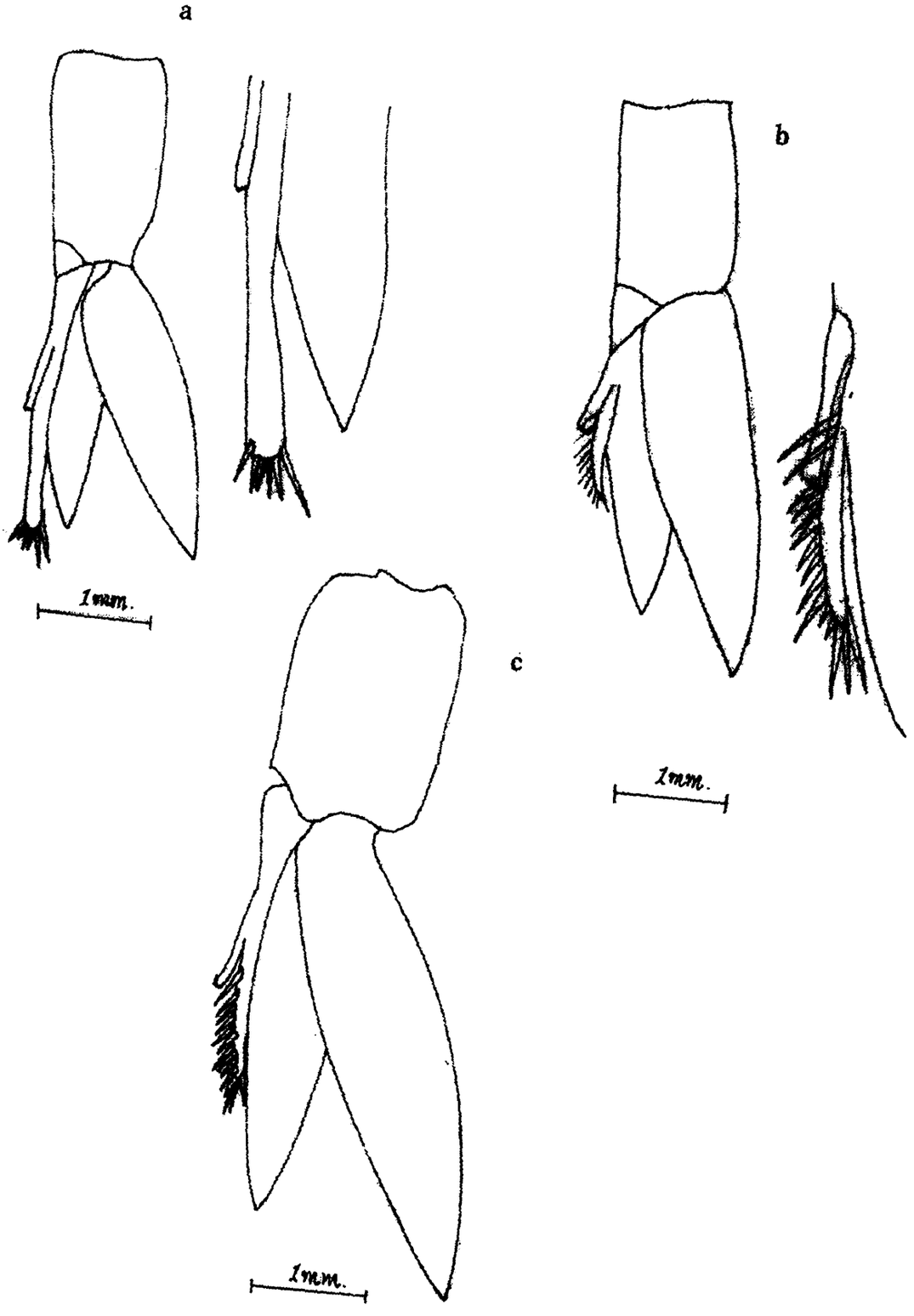

Fig - 29 ***2nd Pleopod of male***

Abdome (Fig. 25, a) : Sixth segment is small and is 0.30 to 0.40 times as long as the carapace.

First pleopod : Endopod of female (Fig. 27, o) 0.24 to 0.31 times the exopod and about 2.6 to 3.2 times as long as its breadth. Endopod in male (Fig. 27, p) possesses a distinct *appendix interna* 0.45 to 0.70 times the exopod and is 3.6 to 4.5 times as long as its breadth.

Second pleopod (Fig. 27, q) : Appendix masculina characteristic, non hairy with few setae at the tip, long, slender, may be subequal, equal or slightly longer than endopod. Appendix masculina 3.07 to 3.91 times as long as *appendix interna*, about 1.0 to 1.21 times the endopod.

Telson (Fig. 27, s & s2) : Elongate, and about 1.42 to 1.70 times as long as 6th abdominal segment and with 2 pairs of dorsal and 2 pairs of posterior spines with 2 plumose setae.

Uropod (Fig. 27, s1) : The exopod without subapical spine.

Colour in live condition : *Macrobrachium lamarrei lamarrei.* Occurs in vegetated areas. Chromatophores are not remarkable.

Discussion

Macrobrachium lamarrei is confined to India (Holthuis 1950). de Man (1908) collected this species from port Canning near Calcutta and described it extensively solving most of the problems that existed in this confusing species.

While dealing the Port Canning material, Holthuis (1950) observed the absence of small accessory spine in the exopods of the Uropod. The same character was later confirmed by Jalihal *et al.*, (1988) while studying the freshwater prawns of Karnataka.

The present collection from 8 different freshwater (4 rivers and 2 lakes and 2 ponds) contains 20 animals. Unfortunately this collection contains no berried females. The male of this collection are notably identified by the characteristic masculina, almost non-hairly, slender, longer than the endopod (Fig. 27, q).

In all the specimens the characteristic absence of the accessory spine in the exopod of the uropod is also noted.

The present material also resembles the subspecies in other characters such as the upturned and slender rostrum, arrangement of teeth on the dorsal margin with gap and on the ventral margin without any gap, typical rpstral formula, rostrum to carapace ratio and proportion of the different segments of the second cheliped.

Tiwari, (1950) observed that, "This species is well distributed all over the sub-continent but not in the hill streams" A special survey was made with regard to the Atyidae of the present work in the type localities of *C.carli and C.cavaleriei industana* Roux (1931). During this survey, contrary to the observation of Tiwari (1950) *M.lamarrei lamarrei* could be collectedfrom Maravakandi dam, built across Moyar river at Masinagudi (about 3000 feet elevation).

9. ***Macrobrachium canarae*** Tiwari., 1958.
(Fig. : 30–32)

1958. *Palaemon canarae* Tiwari., *Rec. Indian. Mus.*, **53** : 298

1988. *Macrobrachium canarae* Jalihal *et al., Rec. Zool. Surv. India, Occ. Paper* No. **112** : 6

Material Examined : 5 males (25 to 50 mm) and 5 non berried females (27 to 55 mm), collected from River Pallar at Vallipuram, River Coovam at Thandarai and ponds at Mathur and Anupambattu.

Z. S. I. Nc. A/C : 11

Diagnosis : Maximum size about 55 mm. Rostrum straight, longer than the antennular peduncle and antennal scale.

Rostral formula $\frac{6 - 9}{4 - 6}$ usually $\frac{6 - 8}{4 - 5}$ with 1 or 2 postorbitals teeth.

Teeth on the dorsal margin arranged with a subapical gap with the proximal and subapical teeth. Antennular peduncle is about 0.5 to 0.6 times the carapace. Carpus of the first cheliped 2.0 to 2.5 times as long as chela. Carpus of the second cheliped 1.8 to 2.0 times as long as chela. First pleopod with endopod about 0.31 to 0.37 times the exopod in females and about 0.45 to 0.55 times in males. Telson about 1.40 to 1.51 times as long as sixth abdominal segments and with 2 pairs of dorsal spines and 2 pairs of posterior spines with 3 or 4 plumose setae. Uropod without any subapical spines on the exopod.

Description :

Rostrum (Fig. 30, a) : Straight, longer than the antennular peduncle and antennal scale.

Rostral formula $\frac{6 - 9}{4 - 6}$ usually $\frac{6 - 8}{4 - 5}$ with 1 or 2 postorbitals teeth.

Teeth on the dorsal margin arranged with a subapical gap with the proximal and subapical teeth. Proportion of the rostrum to that of carapace is 0.90 to 1.51 times. Eyes prominent with broad and well pigmented cornea.

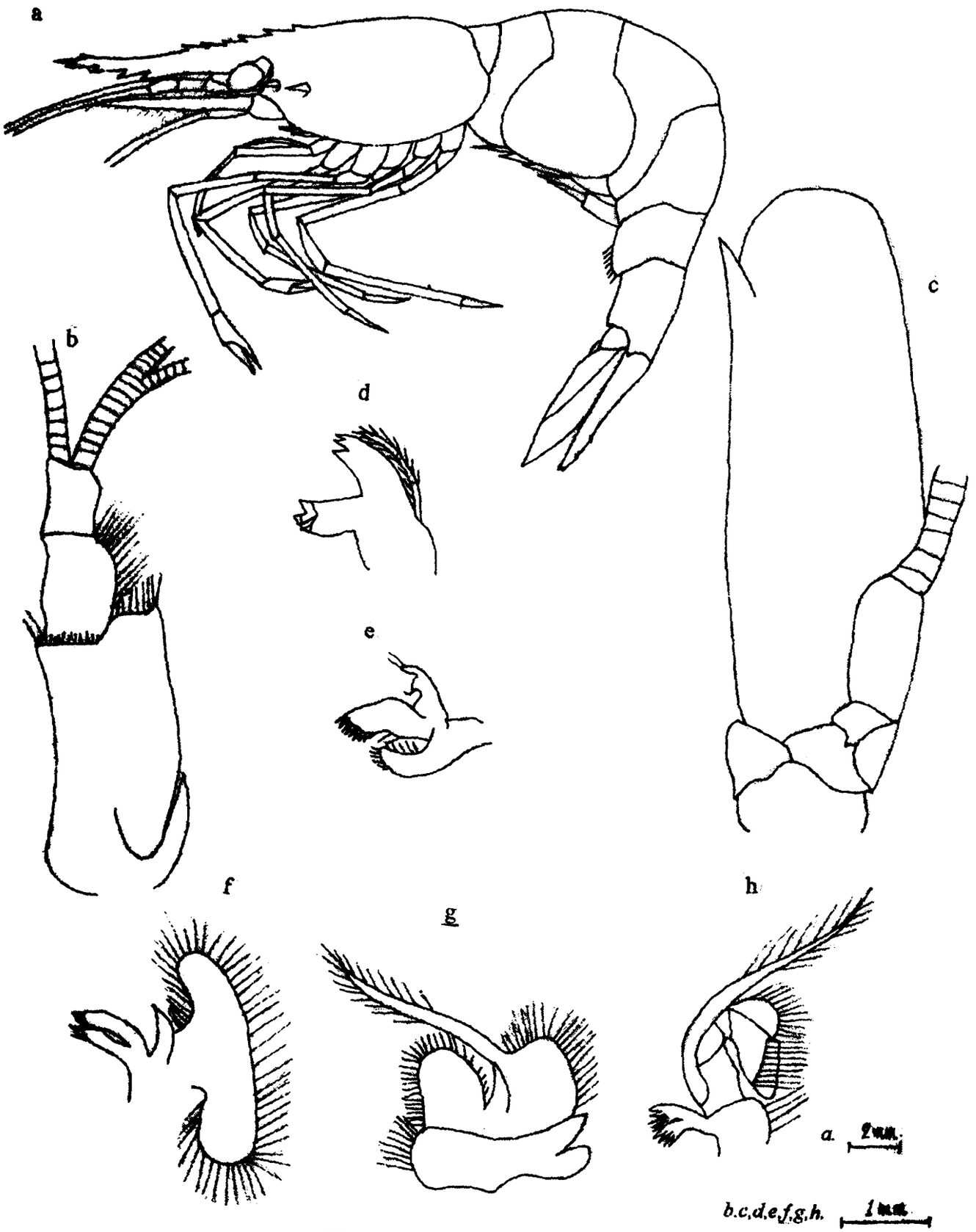

Fig - 30 ***Macrobrachium canarae***

Antennule (Fig. 30, b) : Peduncle slender and is about 0.5 to 0.6 times as long as the carapace. Stylocerite slender nearly 1/3rd of the basal segment of the peduncle. Anterolateral teeth prominent and slender. The outer flagellum with two branches. Which are united basally for 7 to 10 segment.

Antenna (Fig. 30,c) : Scale long about 2.70 to 3.45 times as long as broad. Outer margin straight terminating in a strong tooth, anterior margin of the lamella is rounded and over-reaches the outer terminal tooth.

Mouth parts (Fig. 30, d to h & Fig. 31, i) : Normal as in figures.

Mandible (Fig. 30, d) : With 3 jointed palp. Third maxilliped (Fig. 31, i) extends beyond the scale by half of the terminal segment.

First pereiopod (Fig. 31, j) : Equal slender reaching the tip of the antennal scale. Fingers 1.1 to 1.6 times as long as palm. Carpus 2.0 to 2.5 times as long as chela and about 0.7 to 0.9 times as long as merus.

Second pereiopod (Fig. 31, k) : Equal, slender reaching the tip of the antennal scale or over-reaching it by chela. Longer than the first pair, measuring about half of the body length. Fingers 0.7 to 0.9 times as long as the palm. The cutting edge of the movable finger with 2 proximal teeth while the fixed fingers with a teeth that fits into that of the movable finger. Chela 0.54 to 0.68 times of carpus, palm shorter than half of carpus. Carpus 1.4 to 1.6 times as long as merus, and is cylindrical and 11.44 to 15.33 times as long as its breadth.

Third to fifth pereiopod (Fig. 31, l, m, n) : Similar in structure.

Abdomen (Fig. 30, a) : Smooth, pleura of the first 3 segments round while 4th and 5th narrow tapering towards anex. Sixth segment is small and is 0.35 to 0.45 times as long as the carapace.

First pleopod : Endopod of female (Fig. 32, o) measures 0.31 to 0.37 times the exopod and 3.0 to 3.6 times as long as its breadth. Endopod of male (Fig. 32, p) 0.45 to 0.55 times the exopod and is 3.10 to 3.72 times as long as its breadth.

Second male pleopod (Fig. 32, q) : Appendix masculina 1.71 to 2.17 times as long as *appendix interna*, about 0.41 to 0.74 times the endopod and with 11 to 14 setae along its margin and 3 strong setae terminally.

Telson (Fig, 32, s & s2) : Elongated with a narrow posterior margin and is 1.50 to 1.60 times as long as the 6th abdominal segment. Dorsal spines 2 pairs, posterior spines 2 pairs, the inner pairs stouter and longer than the outer pairs. A median spine and 3 or 4 plumose setae are present between the spines.

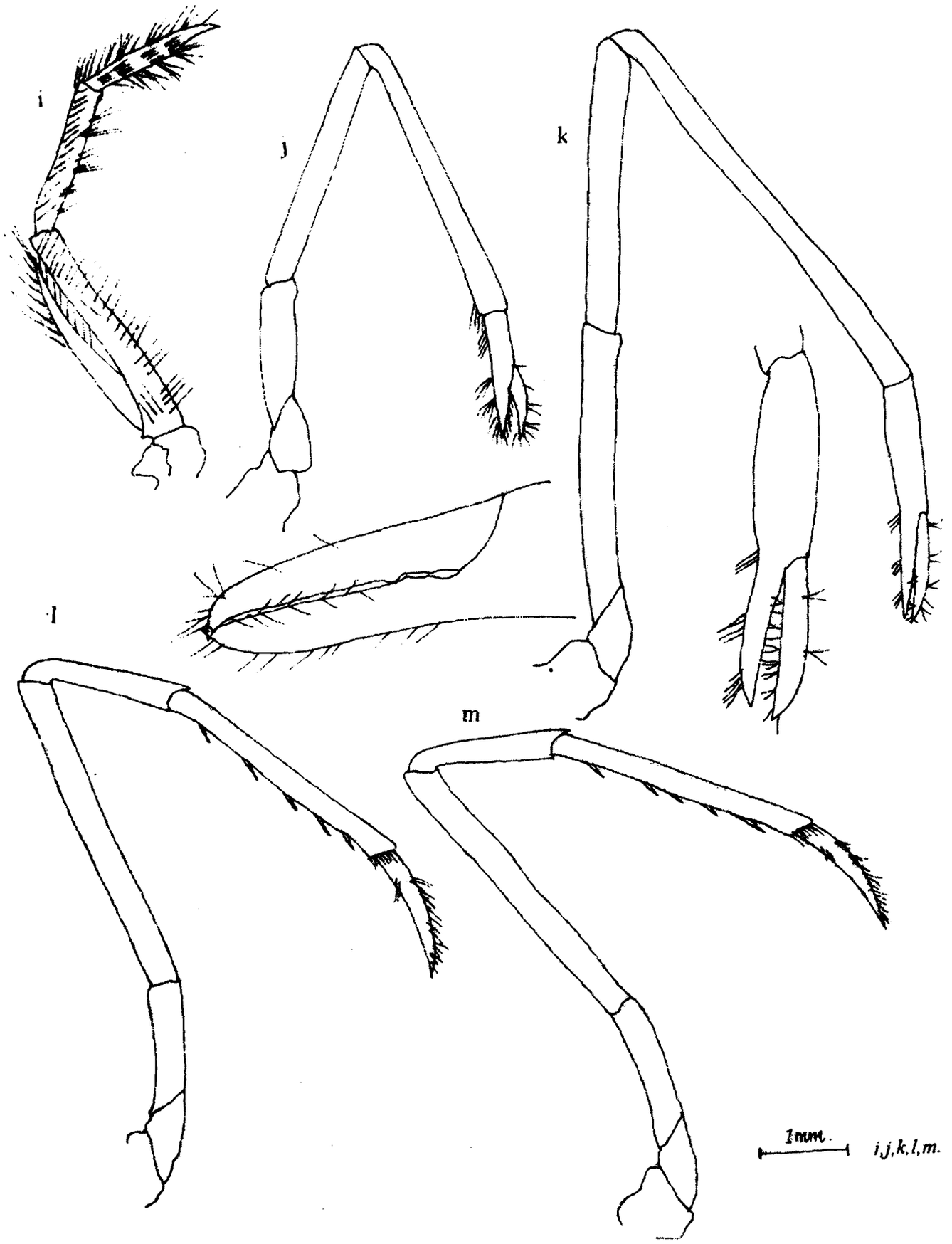

Fig - 31 ***Macrobrachium canarae***

Uropod (Fig. 32, s1) : The exopod of the uropod without any subapical spine.

Colour in live condition : The prawns were collected by carrying the net along the bridge walls, where they are seen attached. In the ponds they are collected from underneath the stones. Usually they are transparent. No remarkable colour pattern is observed.

Discussion

This species was first described by Tiwari (1958) from South Kanara district of Karnataka providing the diagnostic characters.

Later Jalihal *et al.*, (1988) while studying the freshwater prawns of Karnataka, collected this material from the type locality and made an extensive study of this species along with the type material from Z.S.I. He compared *M.canarae* with the other two closely related forms, *M.lamarrei* and *M.lamarrei lamarroides* and distinguished *M.canarae* from these forms by five characters.

Of these five characters, rostral formula of these forms are over lapping, while the rest, distinguished *M.canarae* remarkably from the rest. *M.canarae* possess a carapace shorter than the rostrum, appendix masculina shorter than the endopod, remarkable chromatophore pattern and it is confined to South Kanara district of karnataka only.

The other two forms have carapace either to rostrum or longer than the rostrum, appendix masculina equal or slightly longer than the endopod. No remarkable colour pattern is observed. While *M.lamarrei lamarrei* enjoys wider distribution all over the Indian subcontinent, *M.lamarroides* is from Logtak lake, Manipur.

The present material is compared to the Karnataka material of Jalihal (1988). However no berried females could be collected. In the four males studied, the appendix masculina are shorter than the endopods.

Regarding the chromatophores, it is necessary to insist a general observation. Richard (1983), while studying the taxonomy and biology of the atyid prawns of the area in and around Madras city, described different types of remarkable colour patterns in the four species of atyid prawns described then. However in the present study the same species collected from Madras city and all over the Chengalpattu district, do not exhibit such pretty colour patterns instead, the prawns in general are pale yellow in colour. While it is realised that elaborate study has to be undertaken beforeattributing any reason as soil pollution, water pollution etc. to the general absence of chromatophore in the freshwater prawns, it is necessary to insist that, the absence of chromatophores in *M.canarae* of Chengalpattu District may be due to the general absence of chromatophores in all the prawns collected from this district.

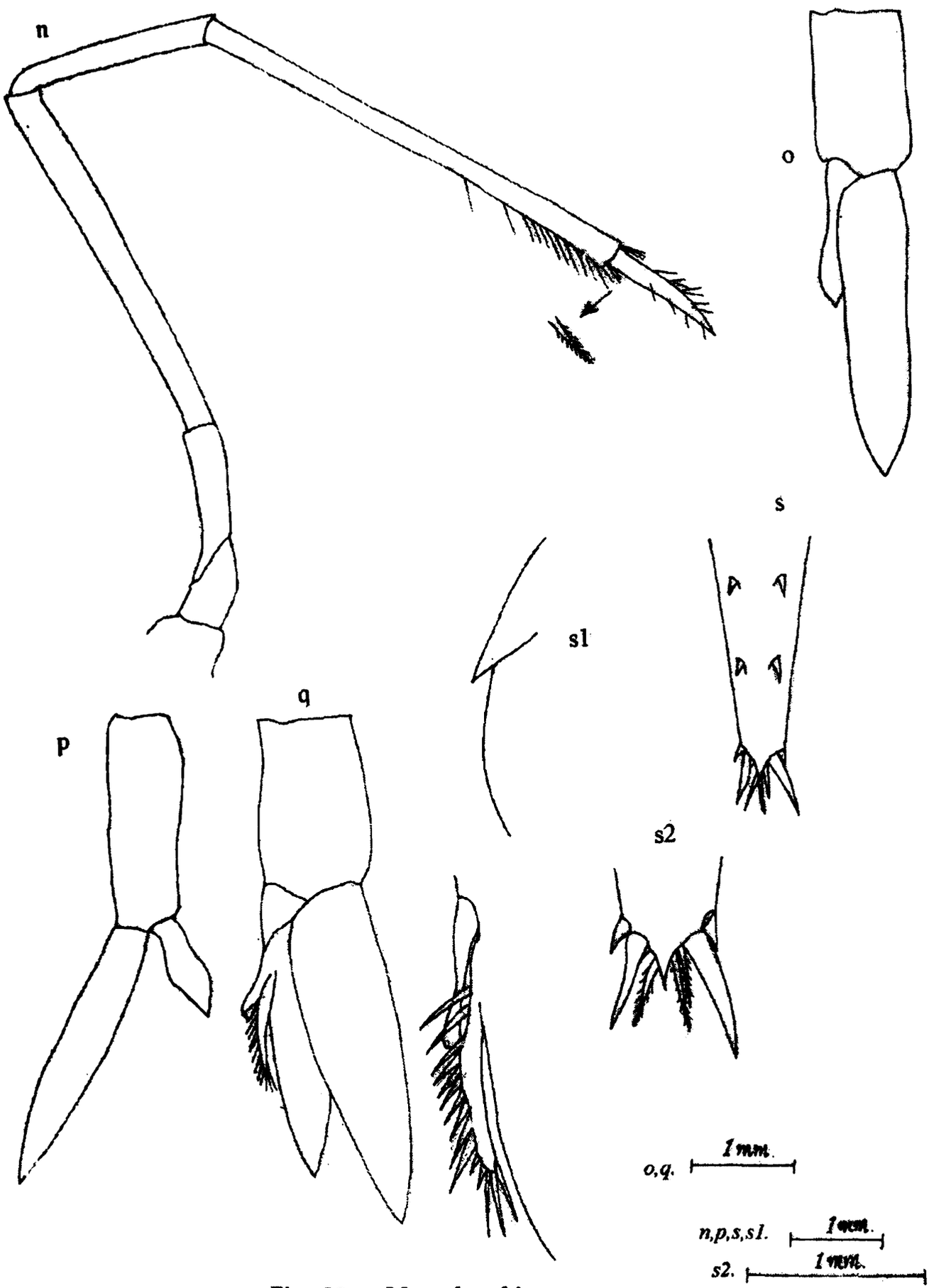

Fig - 32 ***Macrobrachium canarae***

Thus by nature of the carapace and by the appendix masculina the present species is allotted to *M.canarae* and this is the first report of this species from TamilNadu, and from any other place in India other than Karnataka.

10. ***Macrobrachium scabriculum*** (Heller)1862
(Fig. : 33–35)

1862. *Palaemon scabriculus* Heller, *Verh. Zool. Bot. Ges. Wien,* **12** : 527

1865. *Palaemon scabriculus* Heller, *Reise. Novara. Zool.,* **2**(3) : 117

1879. *Palaemon (s.s) dolichodactylus* Hilgendorf, *Mber. Akad. Wiss. Berlin,* 1878 : 840

1892. *Palaemon scabriculus* Koelbel,footnote in de Man *Max. Weber's Zool. Ergebn.,* **2** : 462

1893. *Palaemon scabriculus* Henderson, *Trans. Linn. Soc. Lond.,* **5** : 442

Palaemon (Parapalaemon) dolichodactylus Deutsch Ost-Afrika, **4**(7) : 31

1900. *Palaemon (Parapalaemon) dolichodactylus* Coutiere, *C.R. Acad. Sci. Paris,* **130** : 1267

1900. *Palaemon (Parapalaemon) scabriculus* Nobili, *Annali Mus. civ. Stor. nat. Geneva,* **40** : 483

1901. *Palaemon dolichodactylus* Coutiere, *Annis Sci. nat. Zool.,* **12** : 283

1902. *Palaemon (Parapalaemon) dolichodactylus* Coutiere, *Bull. Mus. His. nat. Paris,* **8** : 516

1903. *Palaemon (Parapalaemon) scabriculus* Nobili, *Boll. Musei Zool. Anat. comp. R. Univ. Torino,* **18(452)** : 12

1903. *Palaemon (Parapalaemon) dolichodactylus* Nobili, *Boll. Musei Zool. Anat. comp. R. Univ. Torino,* **18**(452) : 13

1910. *Palaemon scabriculus* Henderson & Matthai, *Rec. Indian Mus.,* **5** : 296

1910. *Palaemon dolichodactylus* Henderson & Matthai, *Rec.Indian Mus.,* **5** : 300

1910. *Palaemon dubies* Henderson & Matthai, *Rec. Indian Mus.,* **5** : 300

1910. *Palaemon dolichodactylus* Stebbing, *Ann. S. Afr. Mus.,* **6** : 385

1915. *Palaemon scabriculus* Kemp, *Mem. Indian Mus.,* **5** : 272

1937. *Palaemon scabriculus* Panikkar, *J. Bombay nat Hist. Soc.,* **39** : 346

1937. *Palaemon dolichodactylus* Panikkar, *J. Bombay nat. Hist. Soc.,* **39** : 346

1942. *Palaemon dolichodactylus* Nataraj, *Curr. Sci.,* **11** : 468

1943. *Palaemon (Parapalaemon) dolichodactylus* Vatova, *Thalassia,* **6**(2) : 12

1950. *Macrobrachium scabriculum* Holthuis, *Siboga Exped. Monogr.,* **39a(9)** : 224

1950. *Palaemon (Parapalaemon) dolichodactylus* Barnard, *Ann. S. Afr. Mus.,* **38** : 779

1956. *Macrobrachium scabriculum* Maccagno & Cucchiari, *Boll. Inst. Mus. Zool. Univ. Torino,* **5** : 361

1960. *Palaemon scabriculus* Rajayalakshmi, *proc. natn. Inst. Sci.India,* **26** : 395(larvae)

1963. *Macrobrachium scabriculum* Johnson, *Bull. natn. mus. St. Singapore,* **32** : 15

1972. *Macrobrachium scabriculum* Costa, *Bull. Fish. Res. Stn. SriLanka (Ceylon),* **23**(1 & 2) : 132

1947. *Macrobrachium scabriculum* Tiwari & Pillai, *J. Zool. Soc. India,* **25** : 20

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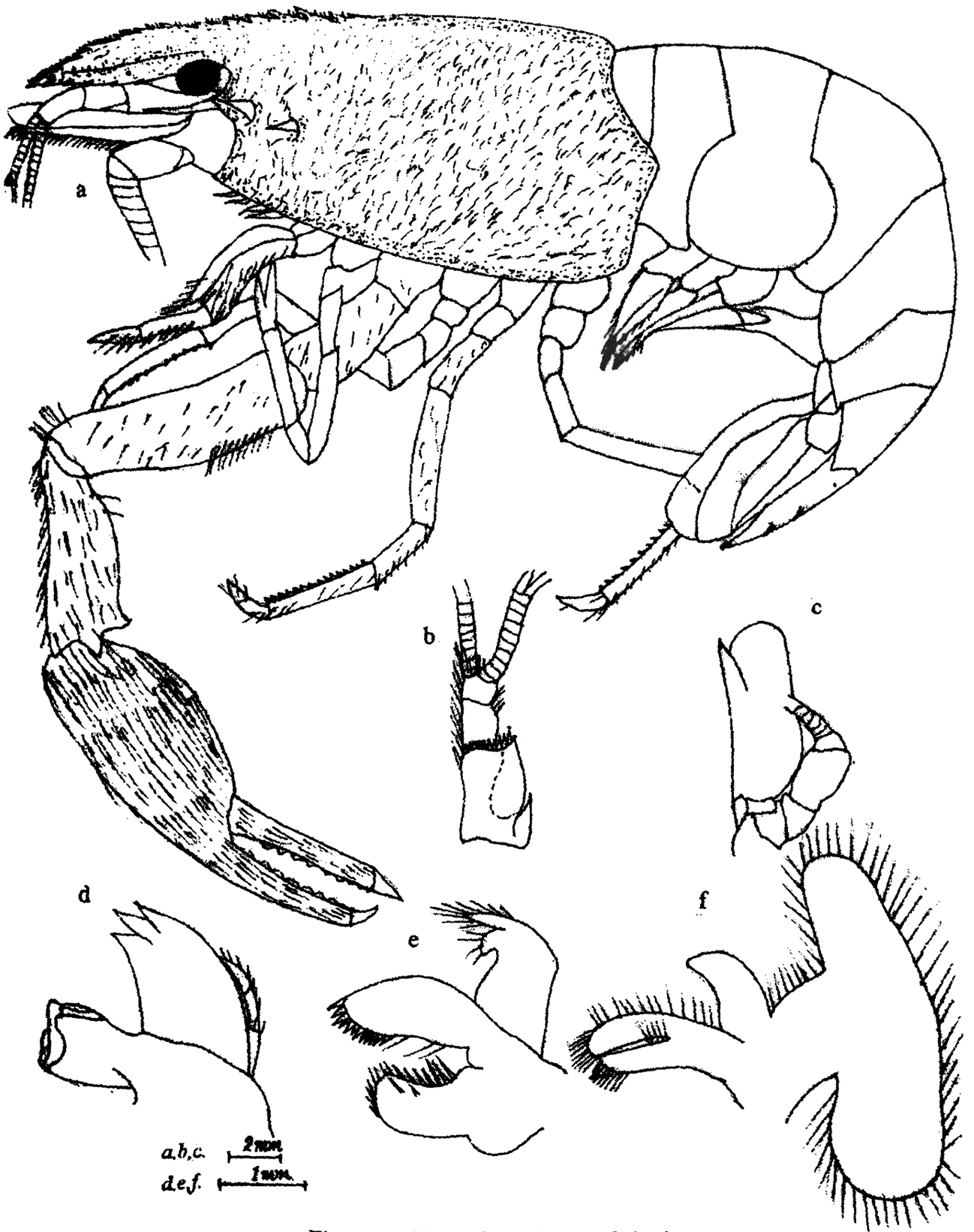

Fig - 33 ***Macrobrachium scabriculum***

Material Examined : 4 males (40 to70 mm), 2 berried females (50 to 70 mm), collected from River Arani at Periyapalayam and River Korattalayiar at Janappanchatram, lake Thenneri.

Z.S.I. A/C : 12

Diognosis : Maximum size about 70 mm. Rostrum staright, reaching the tip of the antennular peduncle or slightly over reaching it.

Rostral formula $\frac{12 - 15}{2 - 5}$ with 4 or 5 post orbitals.

Teeth on the dorsal margin of rostrum are arranged compactly and those on the carapace slightly distantly. Carapace is scabrous. The distance between the first tooth and the posterior margin of the orbit is 0.3 to 0.35 times the entire carapace. Antennular peduncle about 0.40 to 0.60 times the carapace. Carpus of the first cheliped 1.80 to 2.32 times chela. The second cheliped in adult exhibiting sexual dimorphism. In adult males one of the 2nd cheliped larger than scabrous. Telson 1.30 to 1.61 times as long as the 6th abdominal segment and with 2 pairs of dorsal spines and 2 pairs of dorsal spines and 2 pairs of posterior spines with 7 – 15 long plumose setae. Uropod with movable accessory subapical spine on exopod.

Description :

Rostrum (Fig. 33, a) : Rostrum straight reaching the tip of the antennular peduncle or slightly over reaching it.

Rostral formula $\frac{12 - 15}{2 - 5}$ with 4 or 5 post orbitals.

Carapace (Fig. 33, a) : Carapace in males more scabrous in nature. In females the anterior half alone scabrous. The proportion of the rostrum to that of carapace is 0.35 to 0.50 times.

Antennule (Fig. 33, b) : Stylocerite slender and short reaches almost 1/3 of the basal segment. The anterolateral teeth of the first segment well produced and is 0.30 to 0.35 times that of the second segment. The branches of outer flagellum fused basally for 7 to 10 segments. Antennular peduncle is about 0.40 to 0.60 times the carapace.

Antenna (Fig. 33, c) : Scale about 2.5 to 3.5 times as long as broad outer margin slightly concave terminating in a tooth. The anterior region of the lamella rounded and over reaches the outer terminal tooth.

Mouth parts (Fig. 33, d, e, f & Fig. 34, g, h, i) : Normal as in figures.

Third maxilliped (Fig. 34, i) : extending upto middle of antennal scale.

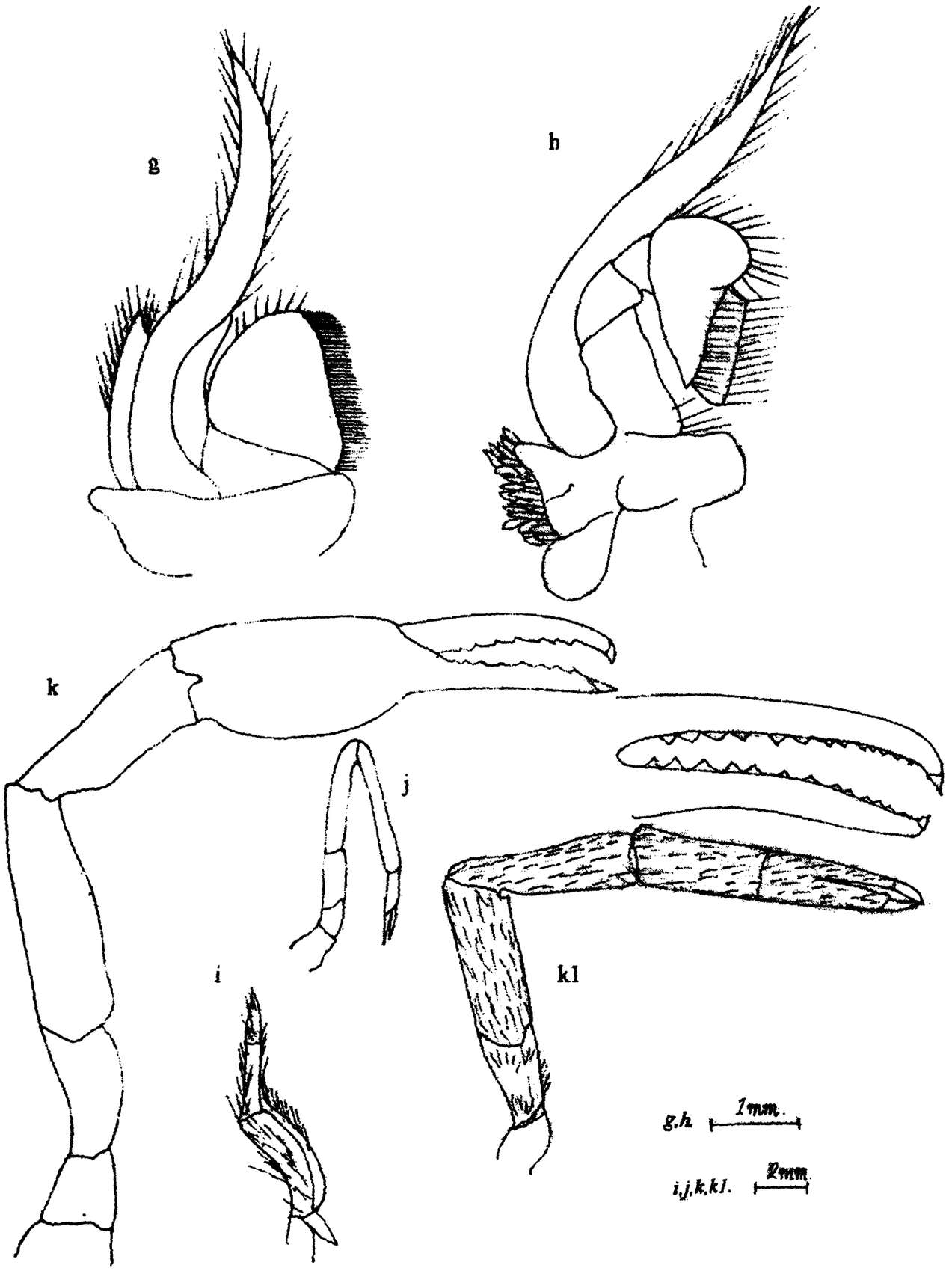

Fig - 34 ***Macrobrachium scabriculum***

First pereiopod (Fig. 34, j) : Slender and extending beyond the antennal scale. Fingers 1.0 to 1.2 times as long as palm. Carpus 1.80 to 2.32 times as long as chela and 1.18 to 1.32 times as long as merus.

Second pereiopod (Fig. 34, k kl) : Exhibits sexual dimorphism. In males, one of the II Chelipeds is stout (either right or left) unequal and longer than body. The palm and a portion of the finger is adorned with velvety pubescence. Minute spinules and long hairs are present all over the surface. Fingers longer and is 1.20 to 1.41 times as long as the palm. Tubercles on movable finger 10 to 13 (1st 2nd 3rd or 5th being the largest) on immovable finger 11 – 13, the 2nd & 3rd being the largest. The tip of the mevable are more curved inwards. When fingers are closed the cutting edges meet and the tip remain crossed. Palm thin and narrow. Carpus 1.19 to 1.29 times as long as the palm and 1.03 to 1.29 as long as the merus.

The smaller cheliped shorter than body and without pubescence. Fingers 1.05 to 1.46 times as long as the palm. Palm 0.77 to 0.87 times as long as the carpus. The tip of the movable finger slightly curved. The cutting edges do not meet when the fingers are closed. 4 to 5 tubercle present on the movable finger while 5 or 6 tubercle on the fixed finger. Carpus 0.97 to 1.00 times as long as merus.

In females second cheliped are subequal. Shorter than body length and sparingly setose. Finger 1.12 times as long as the palm. Movable finger with 4 tubercle and immovable finger with 5 tubercle and the first teeth the largest on both the fingers. Carpus 1.37 times as long as the palm and 1.10 times as long as merus.

Third to fifth pereiopod (Fig. 35, l, m, n) : Similar in structure.

Abdomen (Fig. 33, a) : Sixth abdominal segment is 0.26 to 0.30 times as long as the carapace and 1.20 to 1.45 times the 5th.

First pleopod (Fig. 35, o) : In male 0.4 to 0.6 times the exopod and 2.5 to 3.00 times as long as its breadth.

Second pleopod (Fig. 27, q) : In males appensix masculina long, narrow, 0.5 to 0.8 times as long as endopod, and 1.40 to 1.60 times as long as *appendix interna.*

Telson (Fig. 35, s) : Telson 1.30 to 1.61 times as long as 6th abdominal segment and with 2 pairs of dorsal spines and 2 pairs of posterior spines with 7 – 15 lonf plumose setae.

Uropod (Fig. 35, s1) : With movable accessory subapical spine on exopod.

Colour in live condition : *Macrobrachium scabriculum* occurs in vegetated areas and below the stones. Animals dark black in colour. Chromatophores are not remarkable.

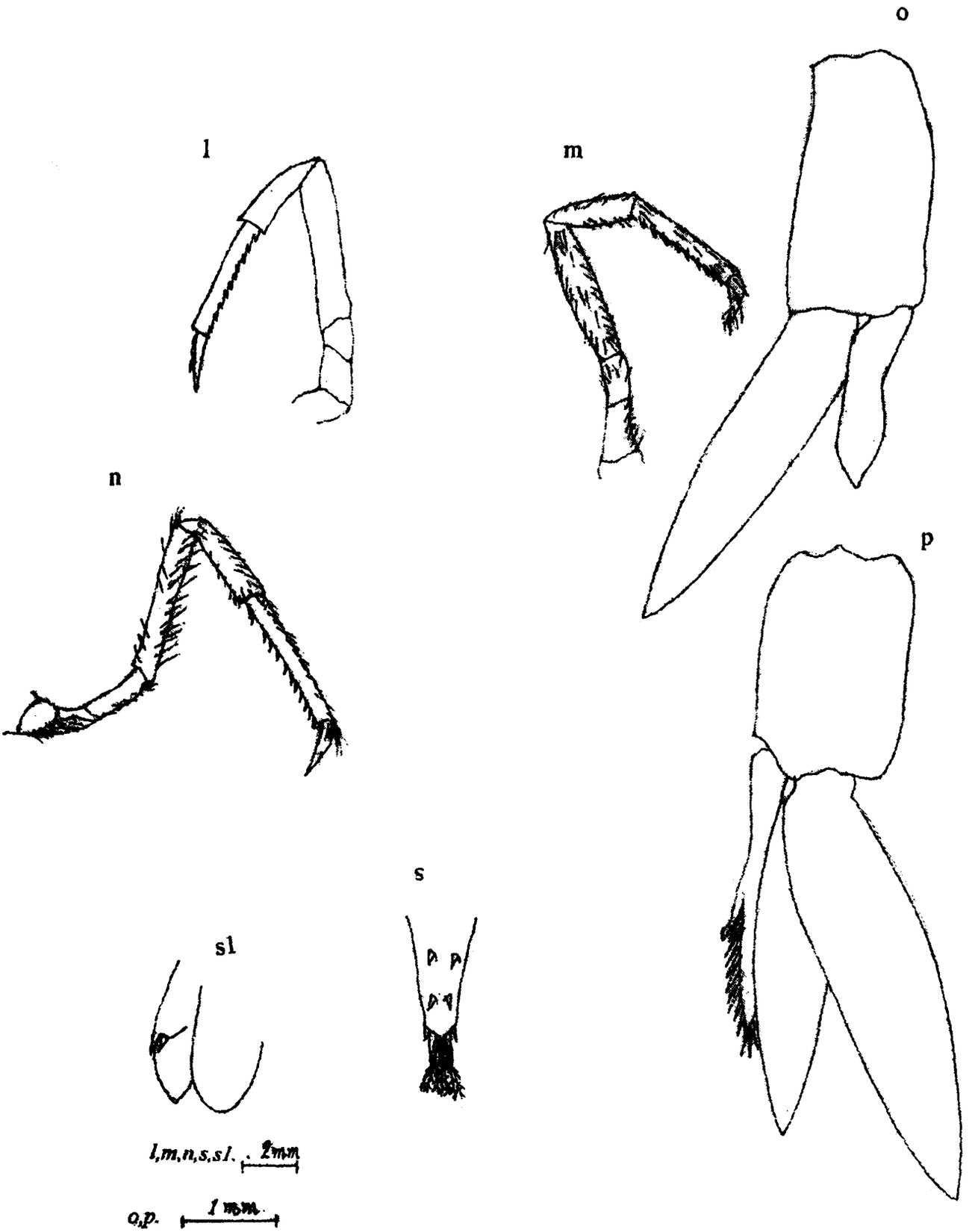

Fig - 35 ***Macrobrachium scabriculum***

Discussion

Macrobrachium scabriculum, is known for its variation. The shape of the second pereiopod was always a matter of discussion.

Henderson & Metthai (1910), collected this speciesfrom several habitats of the present Chengalpattu District and described in detail the variations in the second pereiopod. They opined that the three forms, *Palaemon scabriculus, P.dolichodactylus* and *P.dubius* belong to one species.

Holthuis (1950), who agreed well with Henderson & Matthai (1910), listed further characters to confirm the identity of the species. Jalihal (1988), reported *M.scabriculum* from Karnataka for the first time. Later Angre (1990), who could collect a range of specimens from Maharastra, dealt with the second cheliped. He classified the specimens into 4 groups based on the changes that take place in relation to age and sex.

In the present study, in all, only 6 specimens could be collected on the basis of which the present discription is given. The morphometric measurements well conform with the earlier studies, yet the interesting variations could not be dealt in detail.

While referring to the locality of *M.scabriculum*, Henderson & Matthai (1910), wrote, "A large series from Madras, Red Hills and Walajabad" The present rarity of this species is a signal to the destruction of freshwater habitats and therefore the freshwater fauna.

Key to the species of the gunus *Macrobrachium* of Chengalpattu district

1 Rostrum straight, equal to or longer than the antennal scale. Post orbitals 1 or 2 in number. Teeth on the dorsal margin of the rostrum uniformly arranged leaving a distal gap. Carapace smooth. The second pereiopod slender, equal or over-reach the antennal scale. No subapical spine in the exopod of uropod 2

– Rostrum straigth reaching the tip of the antennular peduncle. Post orbitals 4 or 5. Teeth on the dorsal margin of the rostrum are compactly arranged unto the tip except for 2 to 4. Carapace is scabrous. The second pereiopod in adult exhibiting sexual dimorphism. Uropod with movable accessory subapical spine on exopod .... *M.scabriculum* Heller 1862.

2. Second pleopod with well developed appendix masculina, non hairy with few setae, long, slender, may be subequal, equal or over-reaching the endopod. Teeth on the dorsal margin leaving a distal gap. Ventral margin of rostrum with 5 to 8 teeth... ..... *M. lamarrei lamarrei* H. Milne Edwards 1837.

– The second pleopod of male with apendox masculina, and is smaller than the endopod. Teeth on the dorsal margin arranged with a subapical gap but with a proximal and subapical teth. Ventral margin with 4 to 6 teeths. ..... *M. canarae* Tiwari 1958.

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