Alella gibbosa, a new species of Lernaeopodidae (Copepoda), from Lake St. Lucia, South Africa

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Alella gibbosa, a new species of Lernaeopodidae (Copepoda), from Lake St. Lucia, South Africa

A detailed description of both sexes of a new species, Alella gibbosa, *is given. Specimens were sampled from the host,* Rhabdosargus sarba *(Forsskål, 1775), collected from Lake St. Lucia, South Africa. Morphological detail was observed with the aid of scanning electron microscopy. This species was compared with its congeners,* A. pagelli, A. macrotrachelus, A. pterobrachiata *and* A. ditrematis.

Although the taxonomic status of the genus *Alella* Leigh-Sharpe, 1925 is still confusing,[1] the characteristics of the antenna, mandible, maxillule and aliform expansions at the base of the cephalothorax separate this genus from related genera. To date, six nominated species are grouped in this genus.[1,2] These are *A. pagelli* (Krøyer, 1863), *A. macrotrachelus* (Brian, 1906), *A. pterobrachiata* (Kabatal 1968), *A. ditrematis* (Yamaguti, 1939), *A. elongata* (Richiardi, 1880) and *A. richiardii* (Nunes-Ruivo, 1966). The latter two species are concidered *species inquirendae.*

A large number of specimens of *Alella* was collected from the St. Lucia estuarine system during a survey in 1992. These were found attached to the tips of gill filaments of *Rhabdosargus sarba* (Natal stumpnose). Type material (holotype and paratypes) will be deposited in the type collection of the Department of Zoology and Biology of the University of the North and in the British Museum (Natural History).

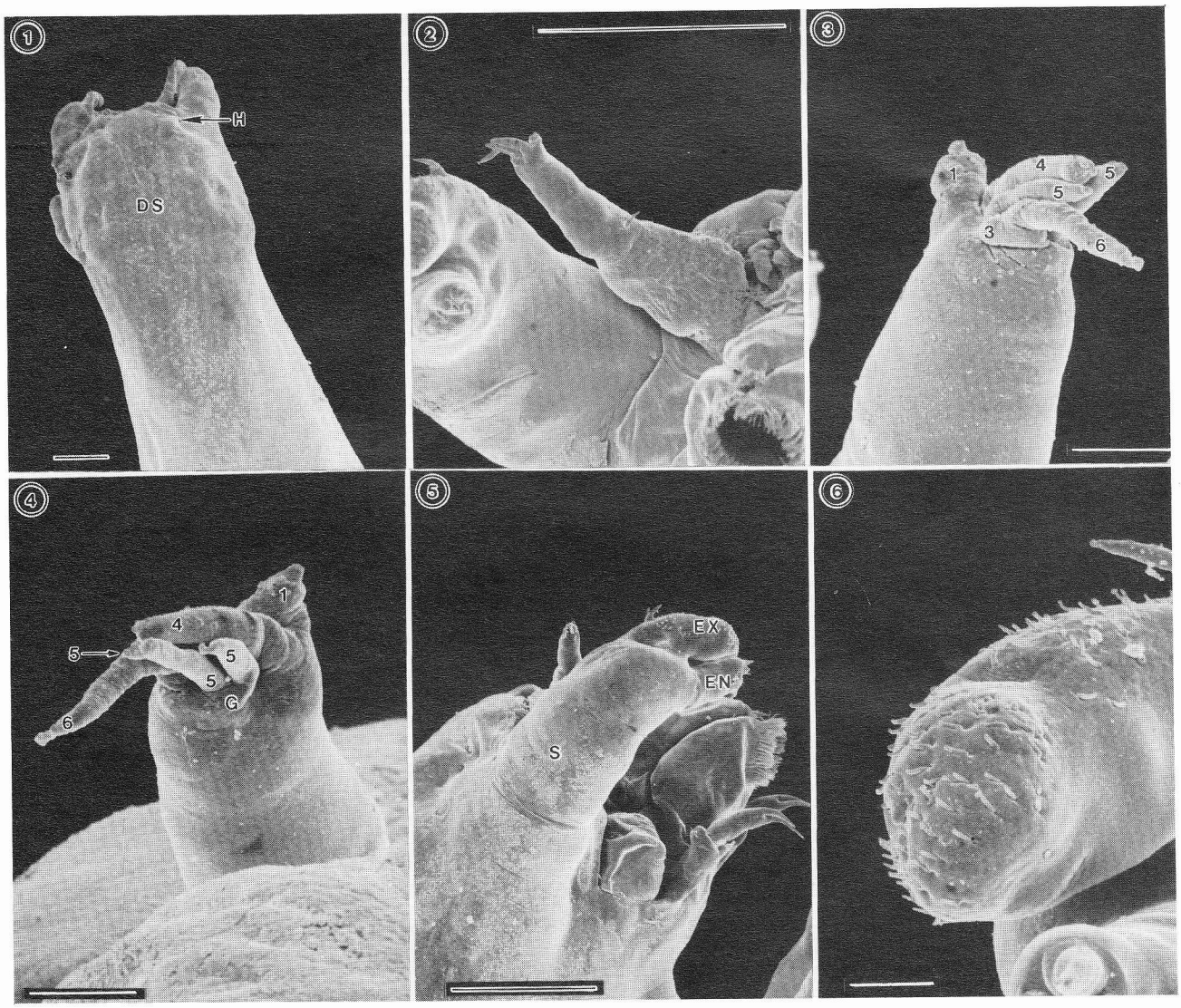
Scanning electron microscopy was used in collaboration with conventional light microscopy for confirmation of structures. Specimens were fixed in 70% ethanol, cleaned in an ultrasonic bath and prepared for SEM using standard methods.

The terminology of Kabata[2] and Huys and Boxshall[3] is adopted. Identification of host species was done according to Smith and Heemstra.[4]

Alella gibbosa sp. nov. (Figs 1–22)

Material examined: Holotype female, 32 female paratypes (some with males attached) in the type collection of the Department of Zoology, University of the North, registration numbers UNIN.SL.8/15,19,23,35, 6 female paratypes (some with males attached) in the collections of the British Museum (Natural History), registration numbers BMNH 1993. 704-709.

Host: *Rhabdosargus sarba* (Forsskål, 1775).



Figs 1–6. Fig. 1. Anterodorsal view of cephalothorax, female. DS, dorsal shield; H, horn like elavations. Fig. 2. Antennule, female. Fig. 3. Tip of antennule, female. 1, tubercle (1); 3, tubercle (3); 4, digitiform seta (4); 5, setae of complex 5; 6, long seta (6). Fig. 4. Tip of antennule, female. 1, tubercle (1); 4, digitiform seta (4); 5, setae of complex 5; 6, long seta (6); G, gibber. Fig. 5. Antenna, female. S, sympod; EX, exopod; EN, endopod. Fig. 6. Exopod of antenna, female. Scale bars: single, 5 μm; double, 50 μm.

Locality: Host collected during a parasitological survey at Fanies Island, Lake St. Lucia, South Africa (28°00′00″S, 32°30′00″E), 25-10-1992 to 1-11-1992.

Location on host: Attached to tips of gill filaments.

Etymology: *gibbosa* (L): refers to shape of aliform swellings at base of cephalothorax.

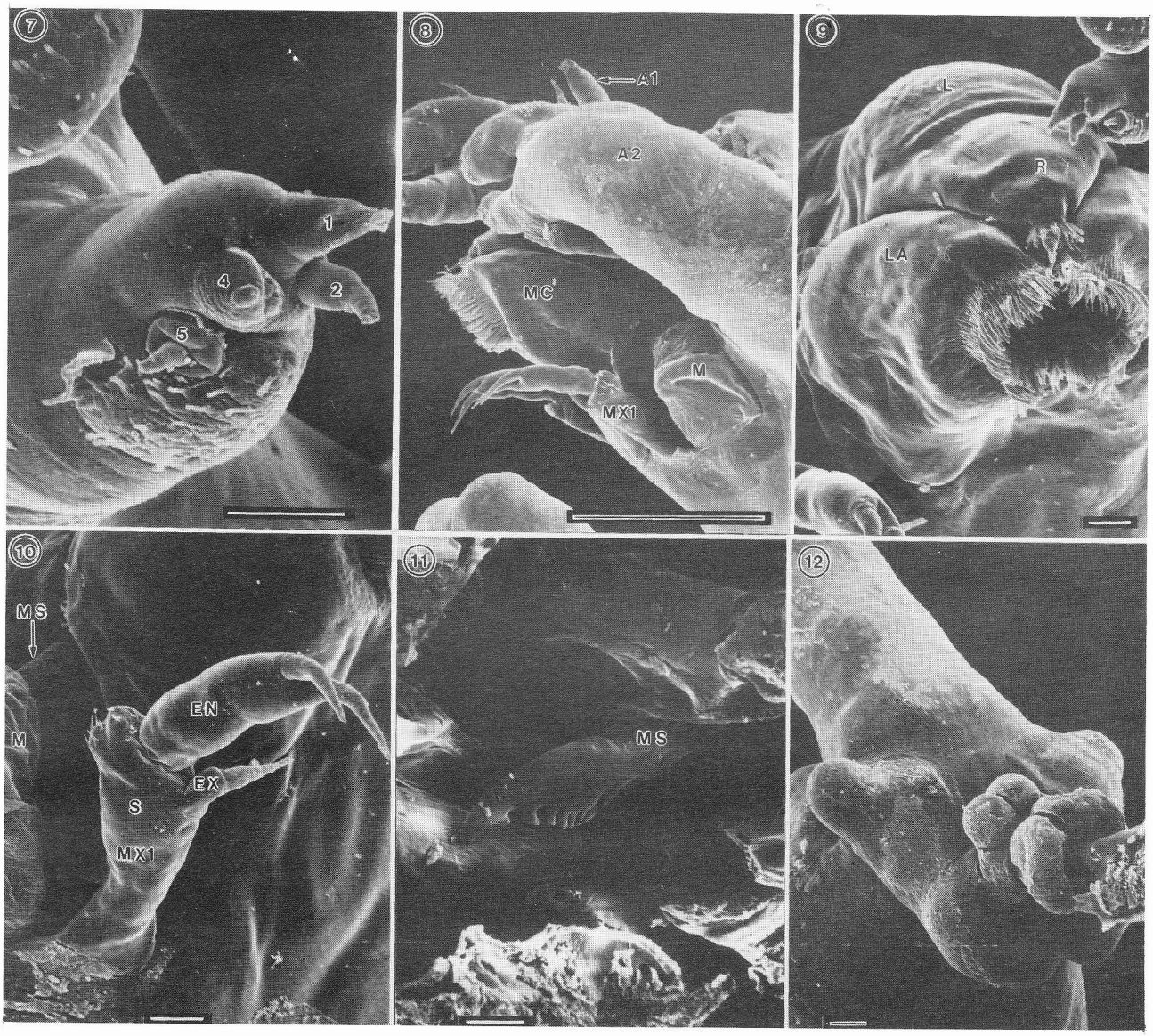
Female (Figs 1–15).

Trunk shape variable in ovigerous females, from rounded (length 1 mm) to elongate (length 1.9 mm), not dorsoventrally flattened, with moderate inflation around anal region; when elongate, anterior region slightly broader than posterior. Cephalothorax at least 1.5 times longer than trunk (in specimens with elongated trunk) and twice as long (in specimens with rounded trunk). Dorsal shield (Fig. 1) with anterior margin rounded into small rostrum, two small horn-like elevations posterolateral to rostrum, lateral margins of shield converging, posterior margin ndistinct. Lateral swellings at base of cephalothorax prominent, more or less equal in size in all specimens examined, bilobed, anterior lobe with thimble-shape swelling.

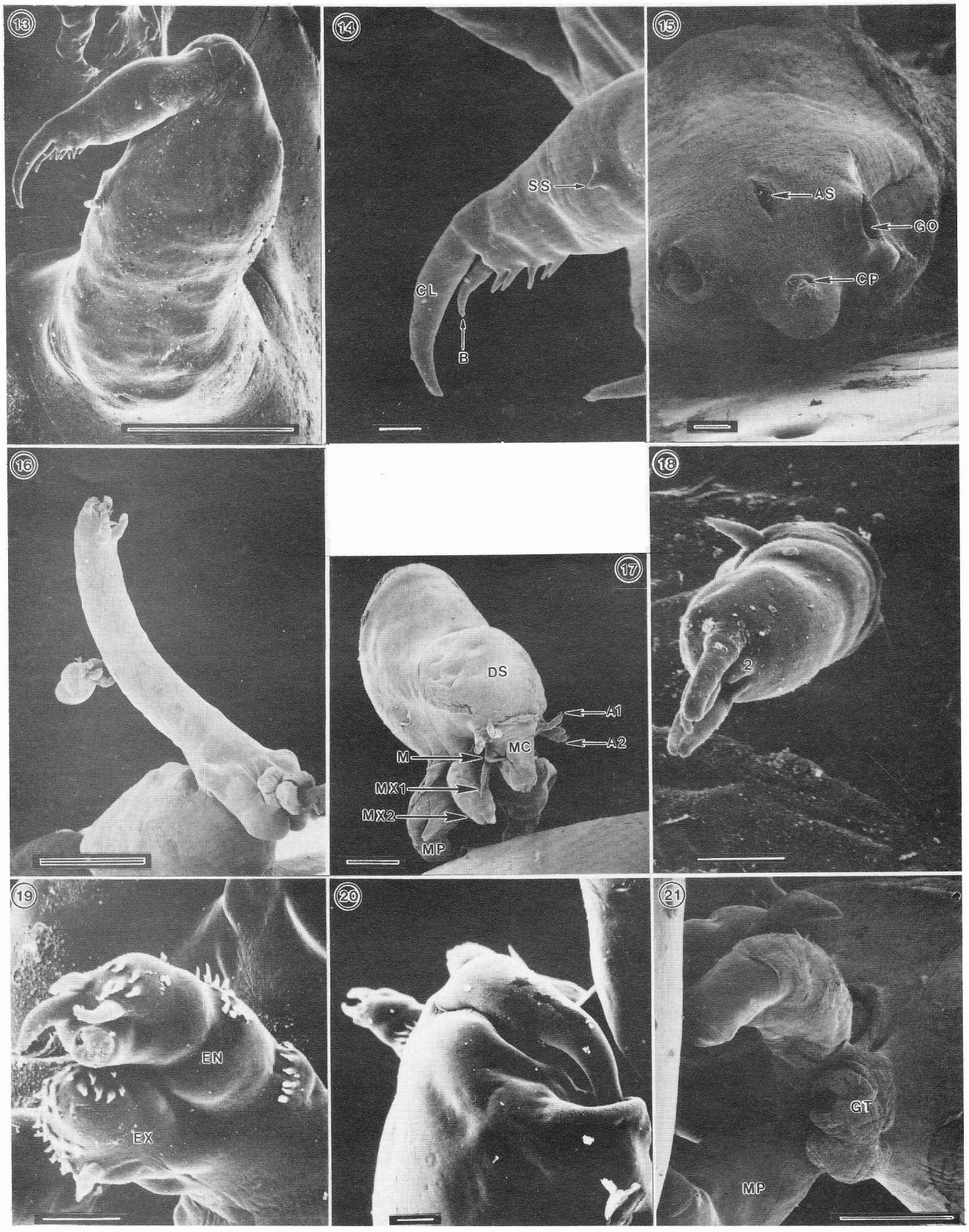
Antennule (Fig. 2) indistincly four-segmented with inflated basal segment; second segment with small whip seta; third segment unarmed; terminal segment (Fig. 3) tapering with apical armature consisting of prominent tubercle (1), digitiform seta (4), long seta (6) closely associated with tubercle (3) and ill-defined gibber (Fig. 4) with three setae of complex 5. Antenna (Fig. 5) with large elongate sympod, rami stout; exopod (Fig. 6) one-segmented with rounded apex, apex and lateral margin armed with scattered spinules, one strong seta laterally on papilla near base; endopod (Fig. 7) two- segmented, equal in size to exopod; apical armature consists of reduced hook (1), lateral seta (2) and processes (4 and 5). Distolateral surface covered with scattered spinules.

Mouth cone (Fig. 8) anteromedial to maxillule, projecting anteroventrally, tapering distally. Tip of labium with fringe of hyaline membrane strips, ending in digitiform structures (Fig. 9). Labrum tapering, with short sturdy seta at tip surrounded by fringe of digitiform structures. Base of mandible inflated with proximal part of shaft outside mouth cone (Figs 8 and 10); tip of mandibular shaft forming flattened blade with seven teeth (Fig. 11).

Maxillule (Fig. 10) long, slender. Sympod margin opposite level of exopod inflated, with a number of sharp spines. Exopod



Figs 7–12. Fig. 7. Endopod of antenna, female. 1, hook; 2, lateral seta; 4, process (4); 5, process (5). Fig. 8. Tip of cephalothorax, female, lateral view. Al, antennule; A2, antenna; M, base of mandible; MC, mouth cone; MX1, maxillule. Fig. 9. Tip of mouth cone, female. L, labrum; LA, labium; R, rostrum. Fig. 10. Base and shaft of mandible and maxillule, female, lateral view. EN, endopod; EX, exopod; M, base of mandible; MS, mandible shaft; MX1, maxillule; S, sym-pod. Fig. 11. Exposed tip of mandible, female. MS, mandible shaft. Fig. 12. Maxilla, female. Scale bars: single, 5 μm; double, 50 μm.



Figs 13–21. Fig. 13. Maxilliped, female. C, corpus; B, barb. Fig. 14. Tip of subchela of maxilliped, female. CL, claw; B, barb; SS, spiniform seta. Fig. 15. Genital segment, female. AS, anal slit; GO, genital orifice; CP, spermathecal opening. Fig. 16. Male attached to ceph-alothorax of female. Fig. 17. Male. Al, antennule; A2, antenna; DS, dorsal shield; M, mandible; MC, mouth cone; MP, maxilliped; MX1, maxillule; MX2, maxilla. Fig. 18. Tip of antennule, male. 2, tubercle (2). Fig. 19. Antenna, male. EN, endopod; EX, exo-pod. Fig. 20. Tip of maxilla, male. Fig. 21. Maxilliped and genital tubercle, male. GT, genital tubercle; MP, maxilliped. Scale bars: single, 5 μm; double, 50 μm; triple, 500 μm.

lateroventrally located, approximately in the middle of appendage; papilliform with strong apical seta. Endopod with two conspicuous setae. Maxillae (Fig. 12) twofold, fused with opposite number; basal part fused to aliform swellings, distal part funnel shaped to accommodate manubrium of bulla; lateral swellings at base of cephalothorax conspicuous, bilobed, anterior lobe with thimble-shape swelling; bulla clavate.

Maxilliped (Fig. 13) large; corpus robust, slightly tapering at

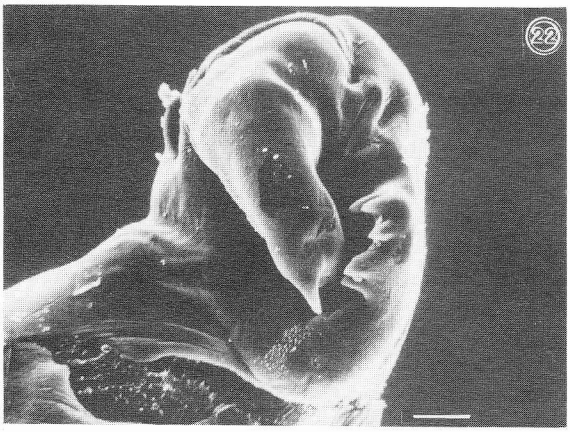


Fig. 22. Tip of maxilliped, male. Scale bar, 5 μm.

junction with subchela, with medial cavity housing base of subchela; myxal area armed with one relatively large rod-like seta; subchela (Fig. 14) with short spiniform seta on shaft, prominent claw and naked barb; adjacent to latter are three pairs and one unpaired (seven) denticles, all approximately equal-sized (Fig. 13).

Genital segment (Fig. 15) tapering posteriorly into papilla bearing two copulatory pores; genital orifices and anal slit as depicted in Fig. 15; egg sacs twice as long as trunk, eggs multiseriate.

Male (Figs 16–22).

Males were found attached to the cephalothorax (Fig. 16), trunk and genital segment of female. Body oval, slightly laterally compressed, no separation between cephalothorax and trunk. Dorsal shield conspicuous (Fig. 17). Appendages arrayed anteroventrally.

Male differs from female as follows: antennule (Fig. 18) as in female except for well-developed tubercle (2); endopod (Fig. 19) of antenna larger than exopod, spinules different from that of female; maxilla with large corpus (Fig. 17) and prominent distomedial sheath, subchela tapering into curved claw (tip fitting in distomedial sheath) and well-developed barb penetrating concavity in terminal margin of corpus (Fig. 20); maxilliped (Fig. 21) with robust corpus, subchela smaller with prominent barb closing into cavity with five prominent teeth on outer margin and smaller claw (Fig. 22); genital tubercle (Fig. 21) posterior to maxilliped.

Discussion

The general description of *A. pterobrachiata* by Kabata[5] does not allow sufficient comparison with the present material, but the shape of the aliform expansions differentiate it clearly from *A. gibbosa*. In comparing *A. gibbosa*, with the other species, prominent differences (sufficient justification to assign this specimen a new species) are found: the variable shape in the trunk of ovigerous females is unique in *A. gibbosa*; the shape of the aliform swellings lateral to the cephalothorax in *A. gibbosa* differ from all other species; apical armature of antennule of *A. gibbosa* with five setae and two tubercles, *A. pagelli* with four setae and one tubercle,[2] *A. macrotrachelus* with seven spines[6,7] and *A. detrimatis* with four setiform spines;[6] apical armature of endopod of antenna unique in *A. gibbosa* with reduced hook (1), lateral seta (2) and processes (4 and 5); *A. gibbosa* with seven mandibular teeth, similar to *A. detrimatis* but different in *A. pagelli* and *A. macrotrachelus* each with eight teeth; denticulation (number and arrangement) of the maxilliped in *A. gibbosa* is different from the other species.

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A new species of Lernanthropus De Blainville, 1822 (Copepoda: Lernanthropidae) from St. Lucia estuary, South Africa

A detailed description of both sexes of a new species, Lernanthropus capistroides, *is given. Specimens were sampled from the host,* Otolithes ruber *(Schneider, 1801), collected from Lake St. Lucia, South Africa. Morphological detail was observed with the aid of scanning electron microscopy. This species was compared with its nearest congener,* L. gisleri *van Beneden, 1852.*

Lernanthropus (with 109 nominate species) is the largest genus of the family Lernanthropidae[1] and is considered a common genus of parasitic copepods. Nevertheless, it is virtually unknown from South Africa with the only references being *L. corniger, L. sarbae* (from Durban), *L. ecclesi* (from Table Bay, Cape Town)[2] and *L. paradoxus* from the Cape.[3] Other southern African species mentioned by Capart[4] include *L. barnardi, L. brevis, L. delamari, L. giganteus, L. gisleri, L. lichiae, L. nunesi, L. theodori, L. trachuri* and *L. villiersi* as well as *L. francai,*[5] all reported from Angola.

Specimens of *Lernanthropus* were collected from the St. Lucia estuarine system during surveys in 1992 and 1993. These were found attached to the gill filaments of four host species of fish. This paper deals with the description of a new species of *Lernanthropus.* The terminology of Kabata[4] and Huys and Boxshall[7] is adopted. Identification of host species was done according to Smith and Heemstra.[8]

Scanning electron microscopy was used in collaboration with conventional light microscopy for confirmation of certain structures. Specimens were fixed in 70% ethanol, cleaned in an ultrasonic bath and prepared for SEM using conventional methods.

Lernanthropus capistroides sp. nov. (Figs 1–28)

Material examined: Holotype female, 21 female paratypes in the type collection of the Department of Zoology, University of the North, registration numbers UNIN.SL.8/21, UNIN.SL.8/45, UNIN.SL.8/47 and UNIN.SL.8/48; 2 male paratypes (1 on SEM-stub) in the type collection of the Department of Zoology, University of the North, registration number UNIN.SL.8/45; 2