



BRILL

Two New Species of *Attheyella* (Copepoda: Harpacticoidea: Canthocamptidae) from Bromeliads of the Serra da Juréia (São Paulo, Brazil)

Author(s): F. D. Por and Valeria F. Hadel

Source: *Journal of Crustacean Biology*, Vol. 6, No. 4 (Nov., 1986), pp. 777-788

Published by: {brill} on behalf of [The Crustacean Society](http://www.jstor.org/stable/1548391)

Stable URL: <http://www.jstor.org/stable/1548391>

Accessed: 14-03-2016 15:41 UTC

Your use of the JSTOR archive indicates your acceptance of the Terms & Conditions of Use, available at <http://www.jstor.org/page/info/about/policies/terms.jsp>

JSTOR is a not-for-profit service that helps scholars, researchers, and students discover, use, and build upon a wide range of content in a trusted digital archive. We use information technology and tools to increase productivity and facilitate new forms of scholarship. For more information about JSTOR, please contact support@jstor.org.



Brill and The Crustacean Society are collaborating with JSTOR to digitize, preserve and extend access to *Journal of Crustacean Biology*.

<http://www.jstor.org>

TWO NEW SPECIES OF *ATTHEYELLA* (COPEPODA:
HARPACTICOIDEA: CANTHOCAMPTIDAE) FROM
BROMELIADS OF THE SERRA DA JURÉIA
(SÃO PAULO, BRAZIL)

F. D. Por and Valeria F. Hadel

ABSTRACT

Two new species of canthocamptid Harpacticoidea are described from the Bromeliaceae of the Nature reserve in the State of São Paulo, Brazil, namely, *Attheyella (Attheyella) jureiae*, new species, and *Attheyella (Canthosella) vera*, new species. Comments on the ecology of harpacticoids in water accumulations of different plant species are added, as well as a few reflections on the difficulties of canthocamptid taxonomy.

Canthocamptid harpacticoids are well known as dwellers of small fresh-water accumulations and even wet tropical soil (Reid, 1984). Among these environments, the phytohelms of the Bromeliaceae have attracted interest of older authors.

The South American limnofauna contains a bewildering diversity of Canthocamptidae, especially belonging to the large and complex genera *Attheyella*, *Elaphoidella*, and *Moraria*. Owing to extensive splitting into subgenera and genera (more than 15 subgenera of *Attheyella* are mentioned by different authors) the systematics of the whole family are unclear. A revision of the Canthocamptidae was begun in the unpublished thesis of Sybille Ebert (1976). To pursue this task will be, however, very difficult, since the majority of the described species are based only on one sex and in many cases only on isolated specimens.

In our opinion, the only procedure to follow for the time being is to maintain the generic and subgeneric categories which appear in Lang (1948), although this author did not carry out revision work on this family.

MATERIALS, METHODS, AND ECOLOGICAL OBSERVATIONS

The copepod material has been collected by one of us (V. Hadel), in the framework of a thesis on the aquatic fauna of the Bromeliaceae.

The samples were collected in the rain forest and dune vegetation of the coastal mountain massif of Serra da Juréia, in the Juréia Nature Reserve in the state of São Paulo (Por and Fonseca, 1984). Seven species in 3 genera of Bromeliaceae have been investigated (V. Hadel, in preparation): *Vriesia incurvata* E. Moor, *Vriesia carinata* Wawra, *Vriesia ensiformis* (Vell.) Beer, *Vriesia friburgensis* Mez., *Nidularium innocentii* Lem., *Nidularium antoineanum* Wawra, and *Quesnelia arvensis* (Vell) Mez.

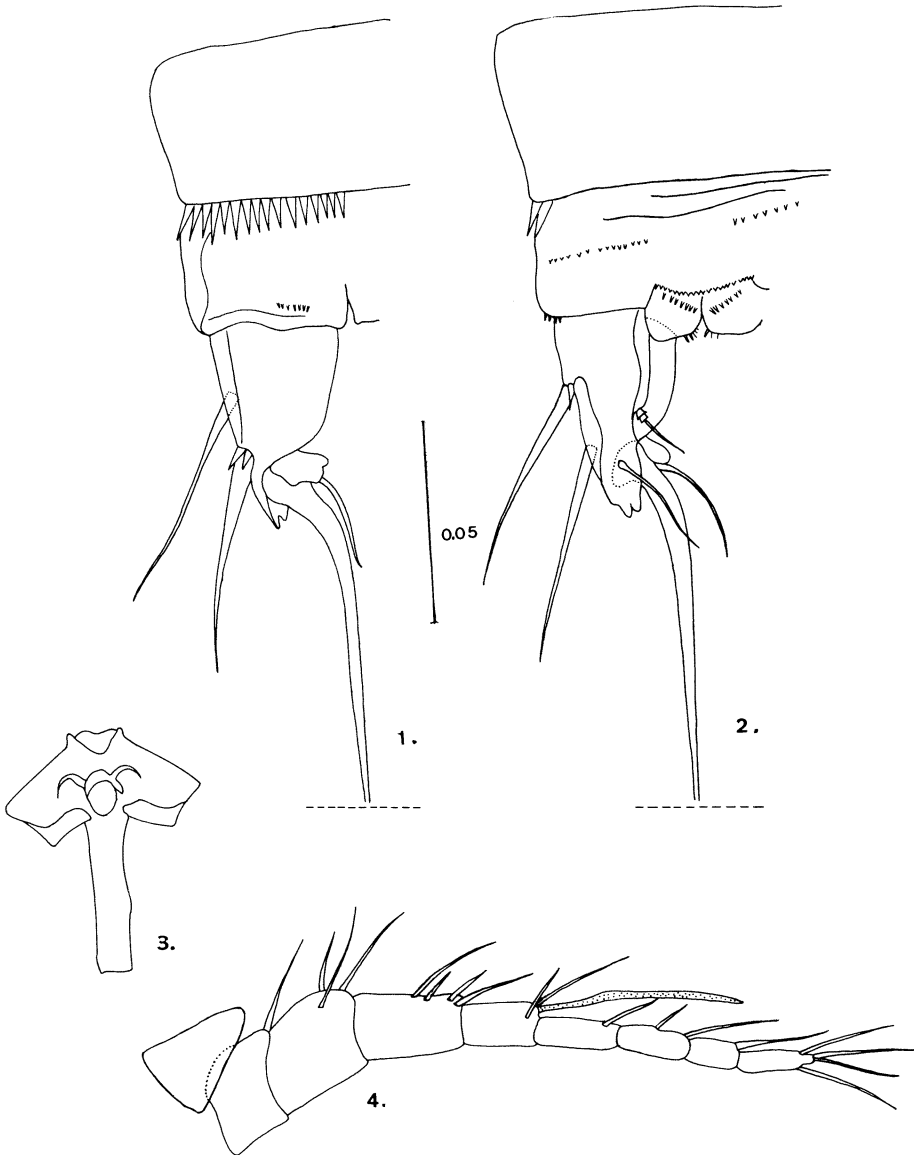
The plants represent different ecological situations, both with respect to the level at which these epiphytes grow and the size of the tanks. For instance, *V. incurvata* grows in the closed rain forest, 1.60-2.30 m above ground; *N. innocentii* grows in the lower story of the rain forest; *Q. arvensis* grows on the soil and on rocks in the open marine supralittoral.

The samples were collected directly from the tanks or from artificial collectors placed there. The collections were made at different seasons during 1982-1984.

The two species of harpacticoids found are *Attheyella (Attheyella) jureiae*, new species, and *Attheyella (Canthosella) vera*, new species.

Attheyella jureiae showed a preference for *Nidularium innocentii*, while the second species did not exhibit a preference for any of the bromeliad species. The populations found were as a rule monospecific. In one sample from *Vriesia incurvata*, *A. vera* was accompanied by two females of a *Moraria*-like harpacticoid. We made no attempt to describe this third species because of scarce material.

According to the observations of one of us (V. Hadel), the two species of harpacticoids are first settlers in the succession which develops in the bromeliad tanks after drought. This has been confirmed also in the experimental collectors.



Figs. 1–4. *Attheyella (Attheyella) jureiae*, new species. Female: 1, furca, ventral view; 2, furca, dorsal view; 3, genital field; 4, antennula.

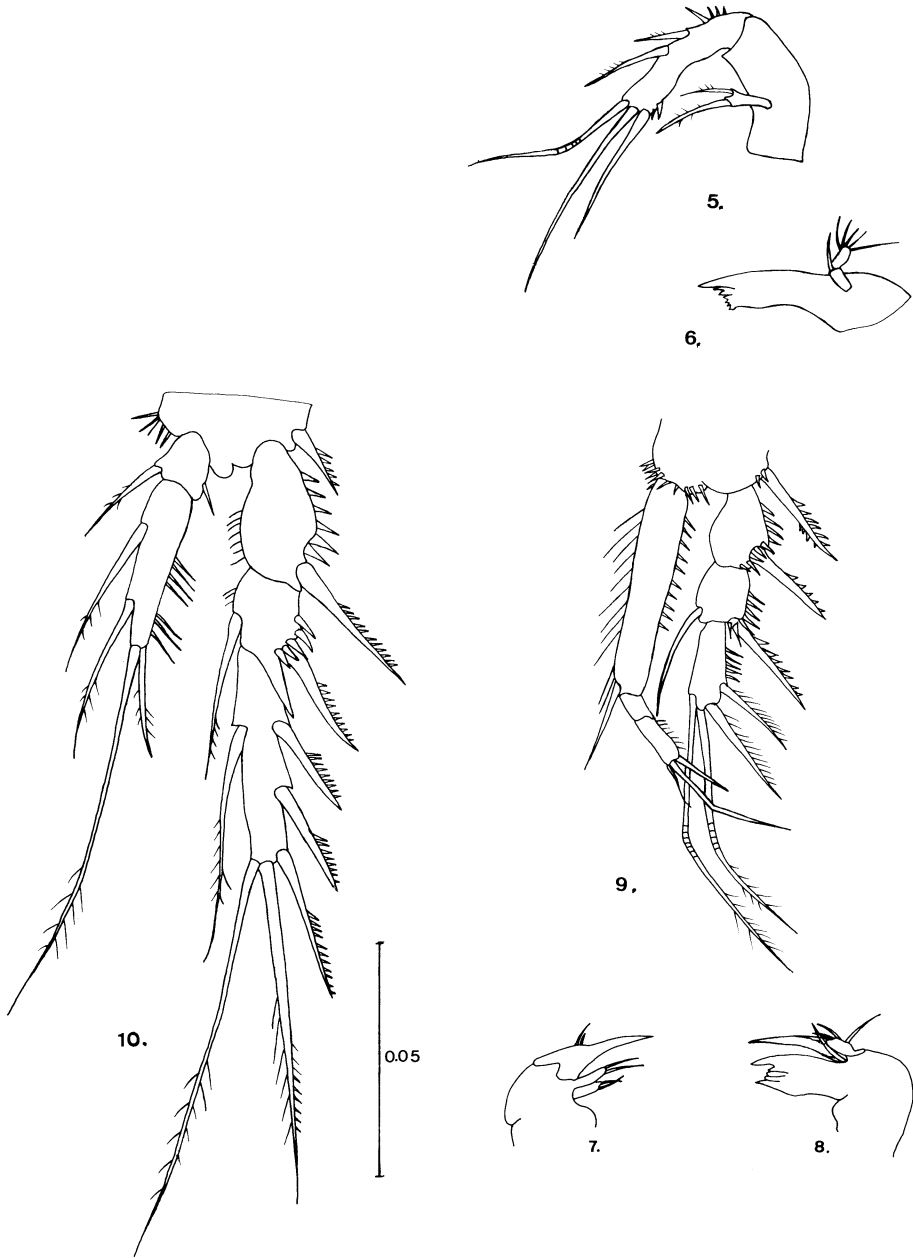
As an additional note, we would like to emphasize that in the Bromeliaceae grown in the botanical garden of the University of São Paulo, only the cosmopolitan harpacticoid *Phyllognathopus vigueri* (Maupas) has been found, evidently replacing the local fauna of bromeliadicolous harpacticoids.

SYSTEMATICS

Attheyella (Attheyella) jureiae, new species

Figs. 1–17 and 35–40

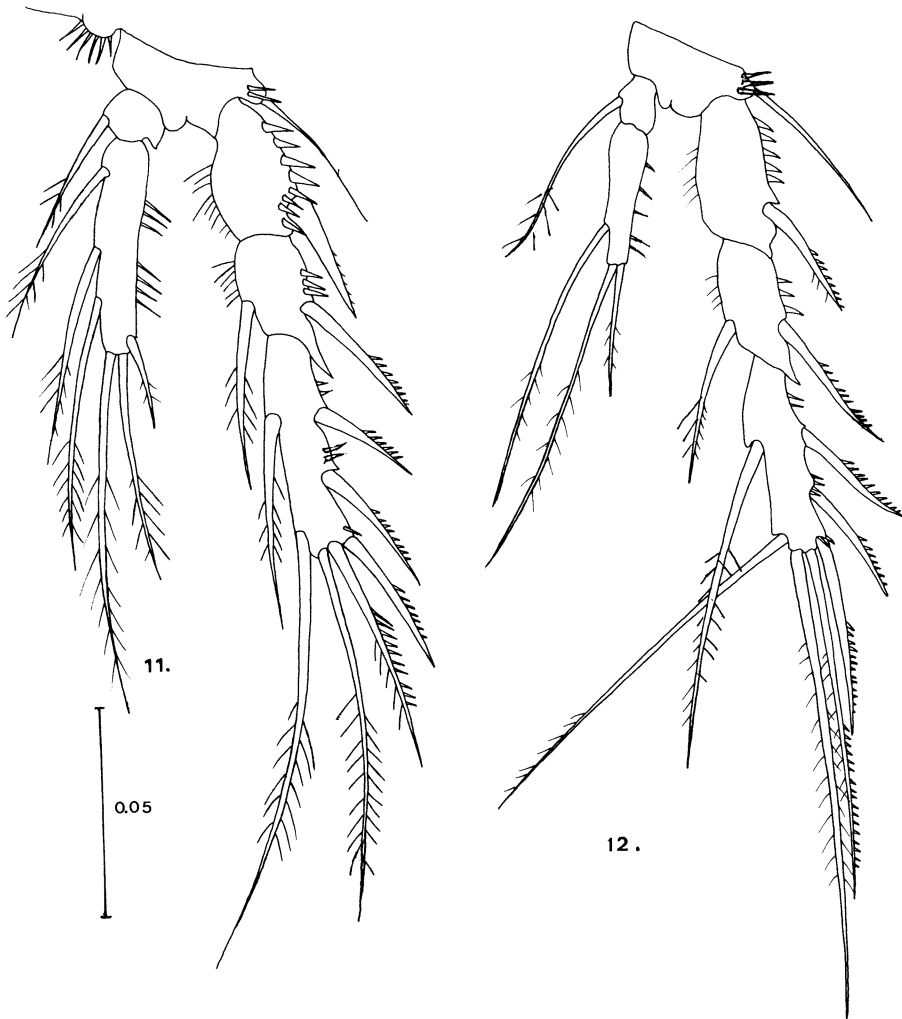
Material Examined.—Holotype ♀, HUI Cop. 123; allotype ♂, HUI Cop. 124; paratypes, Department of Zoology, University of São Paulo.



Figs. 5–10. *Atheyella (Attheyella) jureiae*, new species. Female: 5, antenna; 6, mandibula; 7, maxilla; 8, maxillula; 9, P I; 10, P II.

Description of new species based on many female and male specimens from tanks of bromeliad *Nidularia innocentii* from Serra da Juréia, São Paulo, Brazil. Species name referring to locality.

Female.—Average length 0.50 mm. Rostrum small triangular. Cephalothorax with navel-shaped dorsal organ (Fig. 38). Body segments with distal edges terminating in triangular serrations (Fig. 39) and bearing several rows of small

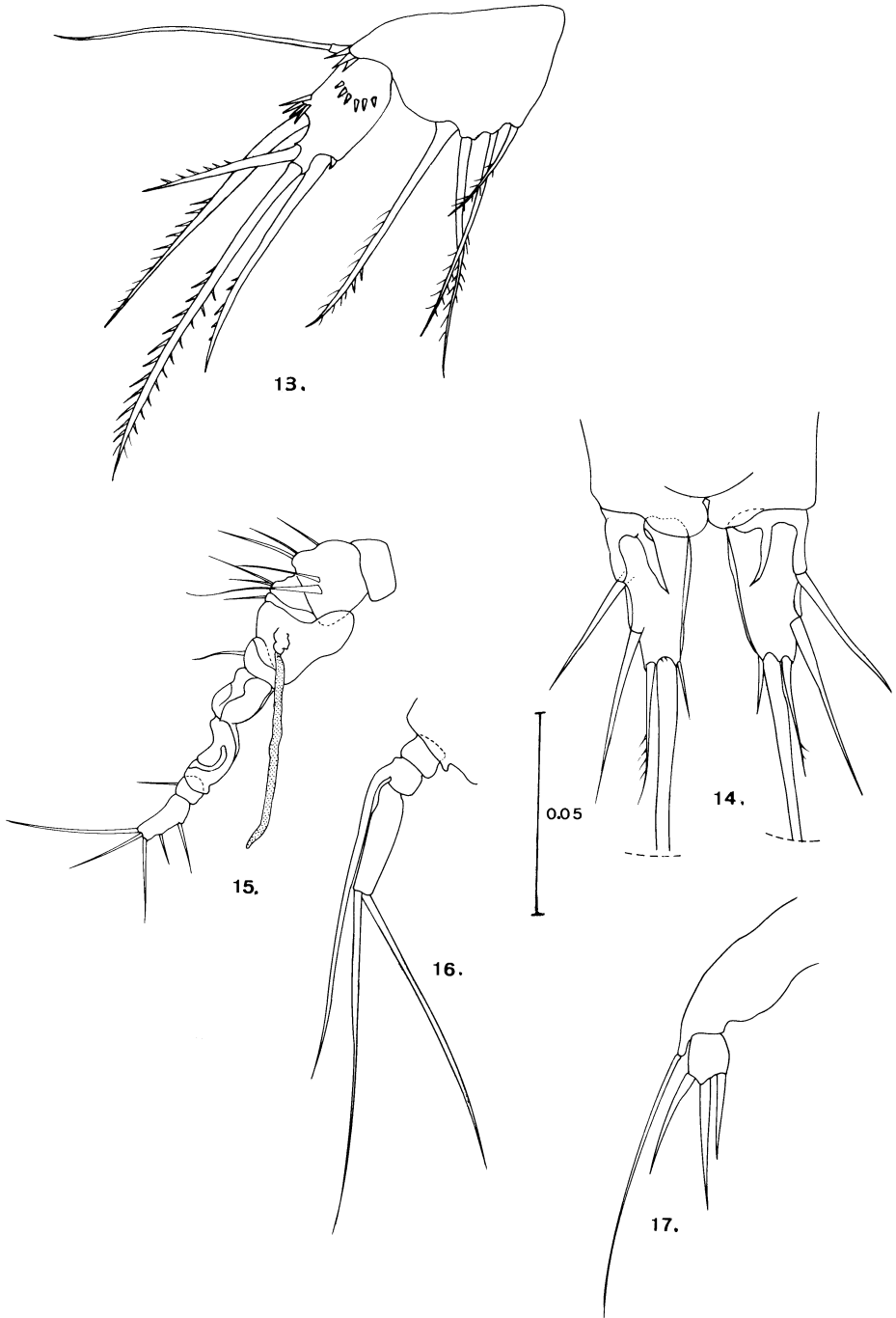


Figs. 11, 12. *Attheyella (Attheyella) jureiae*, new species. Female: 11, P III; 12, P IV.

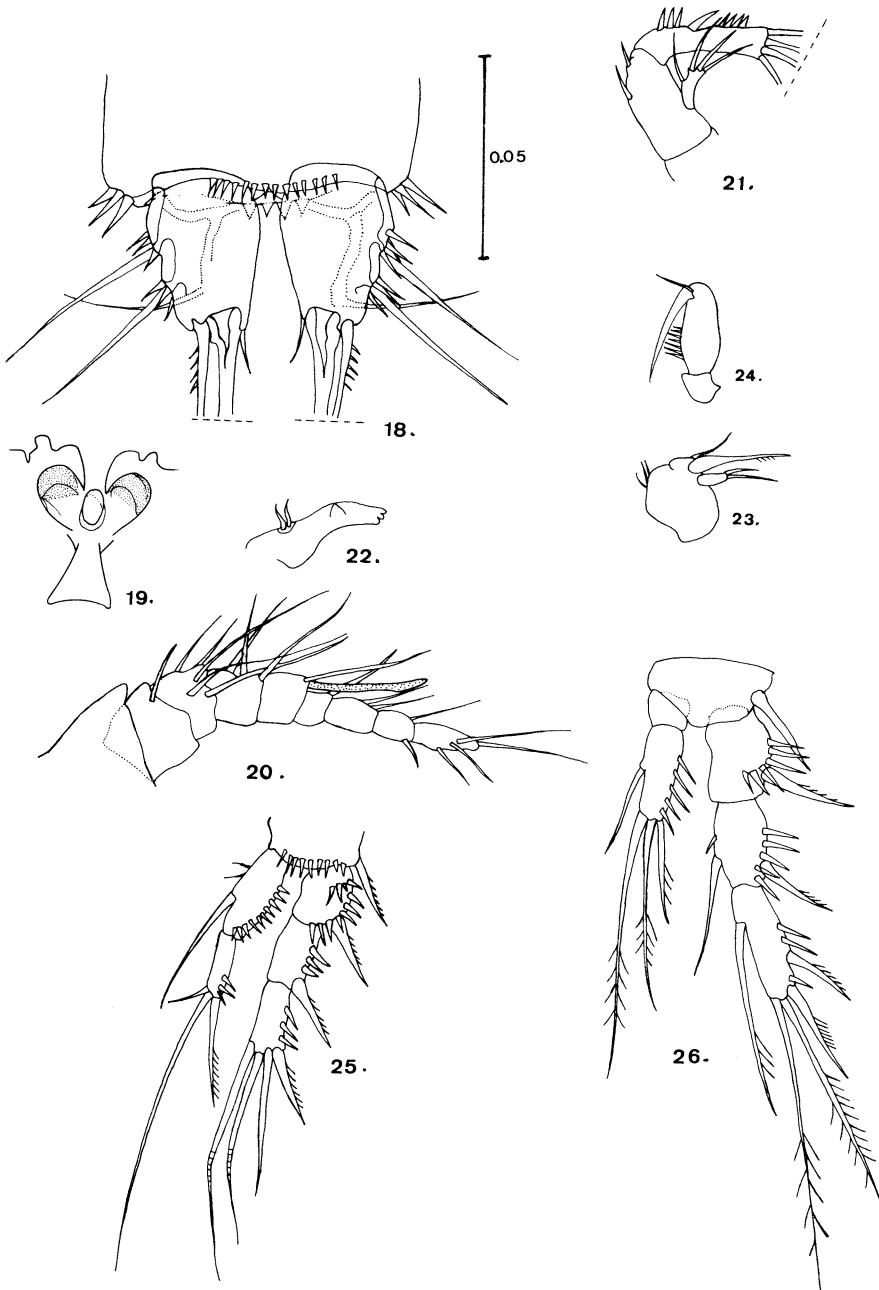
denticles. Dorsal segment edges with continuous row of distal spines. This row of spines generally interrupted on ventral side with exception of penultimate segment having continuous row. Genital field as shown in Fig. 3. Operculum with finely frilled edge and no prominent armature.

Furca basically pyriform with complicated structure (Figs. 1, 2). Dorsally very strong keel. Only 1 well-developed apical spine having inwardly curved falciform basis. This seta carried ventrally on slightly bifid lappet-like projection of furca. Relatively small second seta (inner apical one?), inserted on another, rather squarish dorsal lappet. Two lateral setae and 2 dorsal ones having normal structure.

Antennula (Fig. 4) 8-segmented with aesthete on fourth segment. Antennal endopodite 2-segmented, exopodite uniaarticulated, bearing 2 setae (Fig. 5). Labrum with no peculiar ornamentation. Mandible with reduced, 2-segmented palp without exo- or endopodite (Fig. 6). Maxillula with reduced palp (Fig. 8). Maxilla with 3 endites (Fig. 7). Maxilliped typical for family.

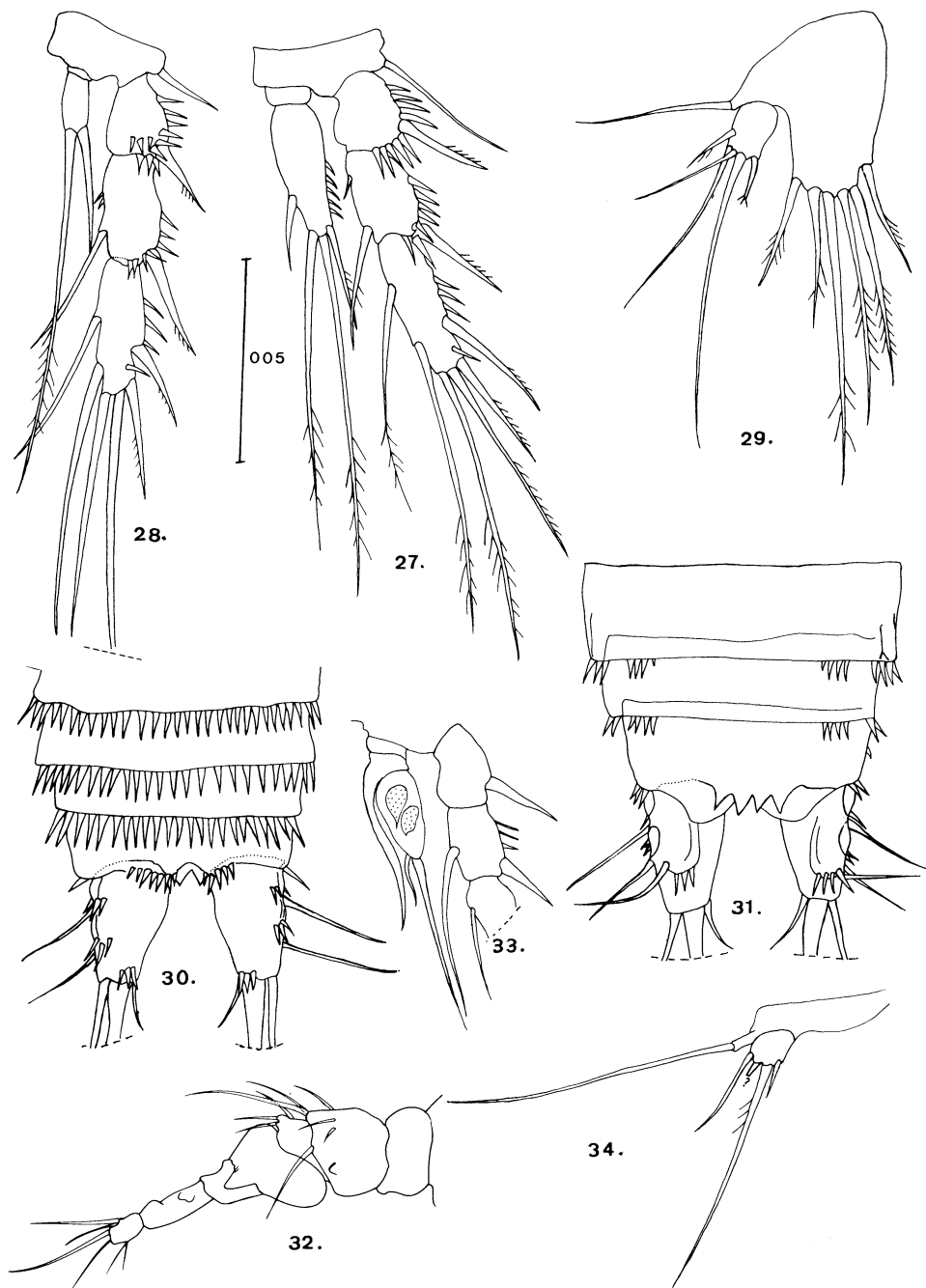


Figs. 13–17. *Attheyella* (*Attheyella*) *jureiae*, new species. Female: 13, P V. Male: 14, furca, dorsal view; 15, antennula; 16, endopodite P III; 17, P V.



Figs. 18–26. *Attheyella (Canthosella) vera*, new species. Female: 18, furca, ventral view; 19, genital field; 20, antennula; 21, antenna; 22, mandibula; 23, maxilla; 24, maxilliped; 25, P I; 26, P II.

First leg with 3-segmented endopodite (Fig. 9). Elongated first endopodite segment nearly reaching end of exopodite. Swimming legs with elongated second endopodite segments. Exopodite armatures normal, without strong external spines. Setal formula as follows:



Figs. 27-34. *Attheyella (Canthosella) vera*, new species. Female: 27, P III; 28, P IV; 29, P V. Male: 30, posterior abdominal segments, ventral; 31, posterior abdominal segments, dorsal; 32, antennula; 33, endopodite P III; 34, P V.

	Endopodite	Exopodite
P II	1.220	0.1.123
P III	1.321	0.1.223
P IV	1.120	0.1.223

Fifth leg (Fig. 13) with barely protruding basiendopodite bearing 4 setae. Exopodite with row of surface setae and 4 strong, nearly spiniform setae.

Male.—Average length 0.45 mm. Abdominal segments with complete dorso-ventral rows of marginal spines. Furcal branches (Fig. 14) of normal shape (without modifications shown by female furca). Setal armature of usual type. Dorsal keel reduced.

Antennula strongly prehensile, apparently of 9 segments (Fig. 15). Endopodite of P III dimorphic (Fig. 16). No other endopodite and no exopodite with modified shape or armature. P V with fused basiendopodites, devoid of setae (Fig. 17). Exopodite with 3 spinelike setae.

Numerical relation between females and males in samples normal (i.e., around 50%).

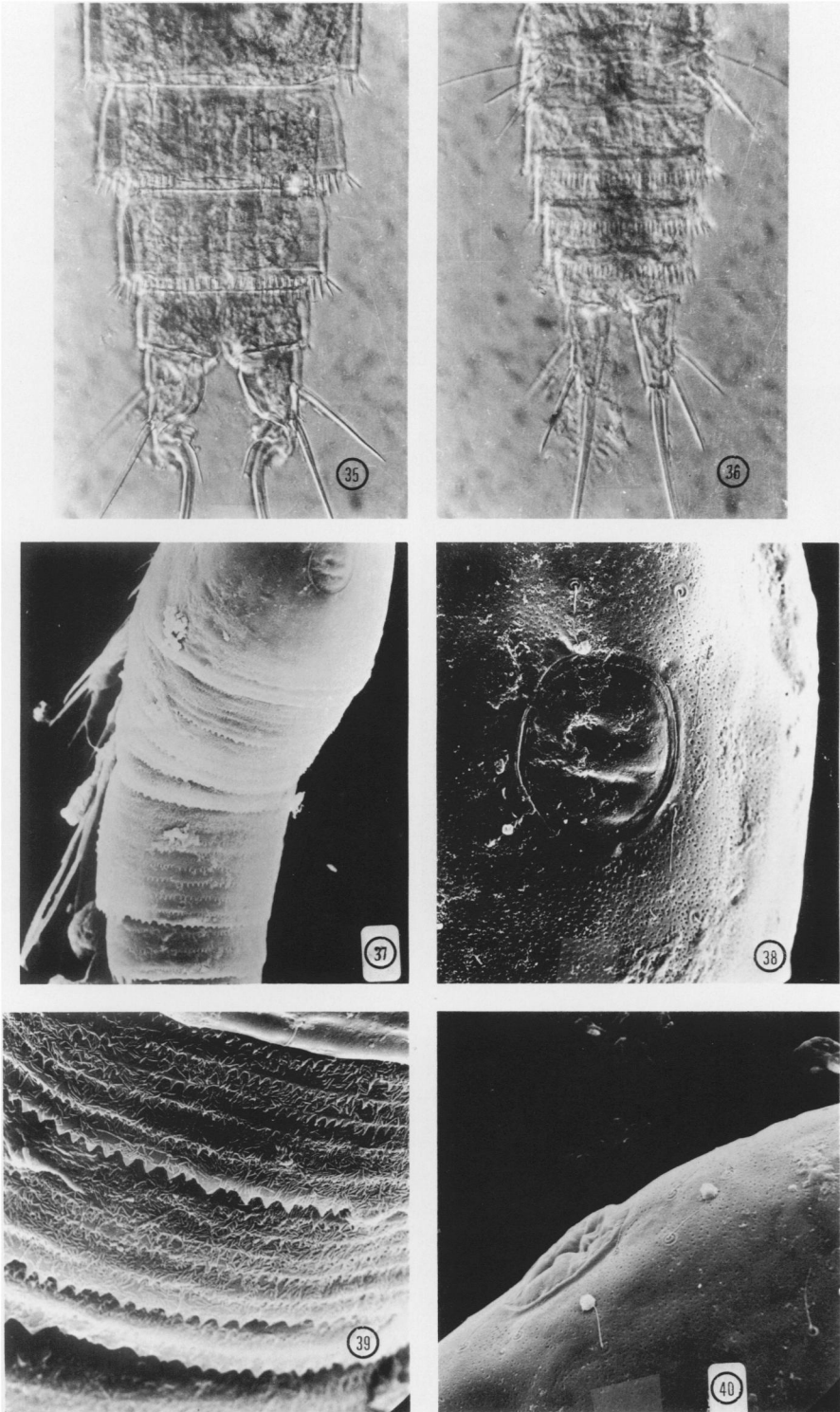
Discussion.—We decided to maintain the new species within the nominate subgenus *Attheyella*, considering the importance of the sexual furcal dimorphism and the presence of a surface row of spinules on the P V exopodite. The reduction of the setation of P V, both in the female and the male, points in the direction of *Elaphoidella*, but our males do not have the dimorphic structures on the exopodites of P III and P IV. These constitute, however, the only positive (synapomorphic) characters for this genus.

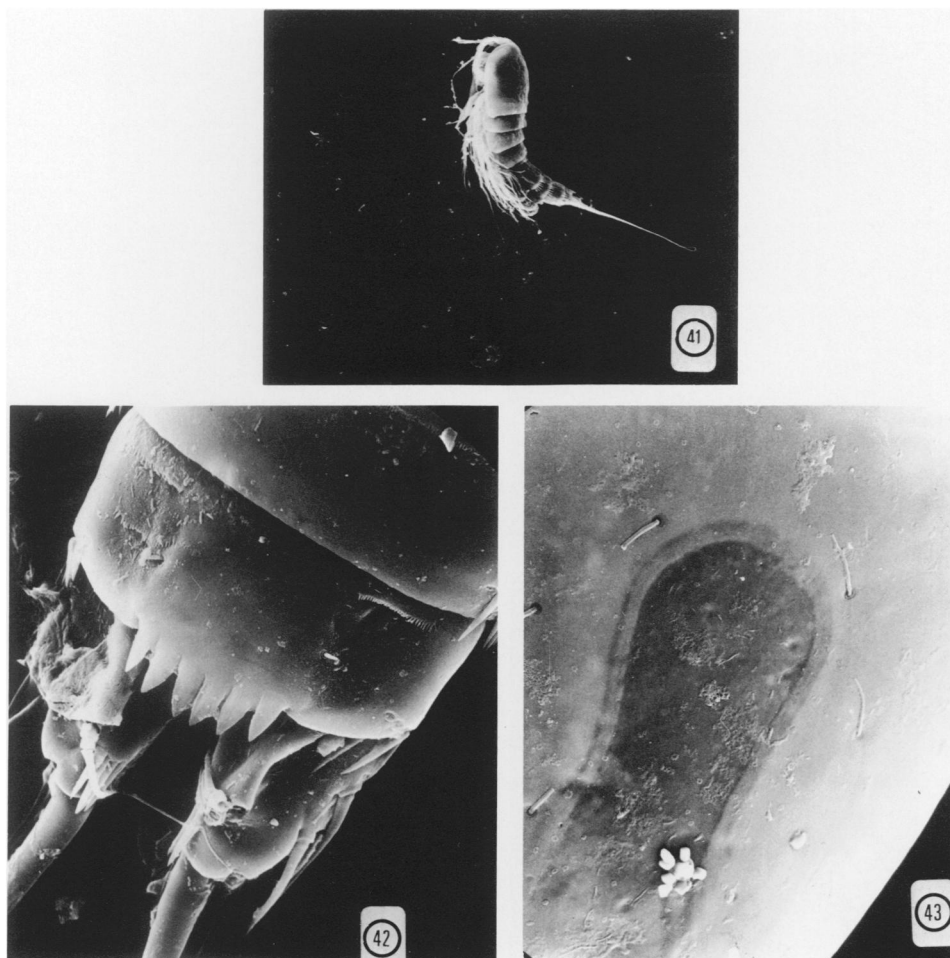
Several species of *Attheyella* sensu stricto are known from Chile: *A. camposi*, *A. vivianii*, *A. bullata*, and *A. laciniata* (Ebert and Noodt, 1975). Though initially considered to belong to the subgenus *Chappuisiella*, Ebert (1976) referred the four species to the nominate subgenus. All four species have been described only from females; these do not have the modified furcal branches of *Attheyella* (*A.*) *jureiae*. From among Löffler's (1961) species, *Attheyella* (*Chappuisiella*) *laevigata* can be considered as an *Attheyella* sensu stricto having, unlike *A. jureiae*, a full set of setae on the P V exopodite and basiendopodite. Kiefer (1967) described three species of *Elaphoidella* from Amazonia. Two of them (*E. negroensis* and *E. paraplesia*) are described only from females and the third (*E. siolii*) from males. Kiefer had many doubts about the taxonomic position of these species. Interestingly, Kiefer gave an early drawing (perhaps the earliest one) of the dorsal organ (Chitinfield) of *E. paraplesia*.

We did not place *A. jureiae* in the subgenus *Delachauxiella*, well represented in South America, since this subgenus is characterized by a prominent triangular operculum. Unaccountably, Lang (1948) collocated *A. aculeata* (Thiebaud) from Argentina in the subgenus *Delachauxiella*, despite the fact that this subgenus does not have this type of operculum. *Attheyella jureiae* being likewise devoid of a pointed operculum differs from this Argentinian species in many respects.

→

Figs. 35–40. *Attheyella* (*Attheyella*) *jureiae*, new species. 35, abdomen of female, ventral ($\times 2,000$); 36, abdomen of male, ventral ($\times 2,000$); 37, partial view of female, dorsal ($\times 3,200$); 38, dorsal organ of female ($\times 11,000$); 39, anterior thoracal segments, female, dorsal ($\times 11,000$); 40, dorsal organ, male, lateral view ($\times 11,000$).





Figs. 41–43. *Attheyella (Canthosella) vera*, new species. 41, lateral view of female ($\times 700$); 42, last abdominal segment, female, dorsal ($\times 8,000$); 43, dorsal organ, female ($\times 11,000$).

Attheyella (Canthosella) vera, new species
Figs. 18–34 and 41–43

Material Examined.—Holotype ♀, HUI. Cop. 125; allotype ♂, HUI. Cop. 126; paratype ♀ and ♂, Department of Zoology, University of São Paulo.

Description based on large number of females and males from tanks of different species of Bromeliaceae of Serra da Juréia, São Paulo, Brasil. Species named in honour of Dr. Vera Imperatriz Fonseca from Department of Ecology, University of São Paulo.

Female.—Average length 0.42 mm. Rostrum short, triangular. Dorsal organ on cephalothorax very shallow, tongue-shaped (Fig. 43). Segment edges straight and bare. Segment surface smooth, with only few very minute combs of setulae. Genital segment with incomplete ventral row of marginal spines. Following abdominal segments with lateral rows of long spines. Last abdominal segment also with ventral comb of relatively small spines (Fig. 18). Genital field shown in Fig. 19. Operculum rounded, not prominent, terminated with 4 or 6 large triangular teeth.

Furcal branches elongate and regularly tapering, less than 2 times longer than broad. Little-pronounced dorsal carina. Transverse row of spines near distal end of carina. Lateral setae strong. External apical seta missing. One strong dorsal seta.

Antennula 8-segmented, relatively short (Fig. 20). Antennal endopodite 2-segmented; exopodite uniaarticulated, with 4 strong setae (Fig. 21). Mandibular palp reduced to knob, bearing two setulae (Fig. 22). Maxillula with equally reduced palp. Maxilla with two endites only (Fig. 23). Maxilliped (Fig. 24) relatively weak.

P I with 2-segmented endopodite, shorter than exopodite (Fig. 25). Endopodite segments subequal. Swimming legs with 2-segmented endopodites. Proximal segments reduced in length, distal ones rounded. Endopodite P IV with 2 setae only. Setal formula as follows:

	Endopodite	Exopodite
P II	0.121	0.1.122
P III	0.121	0.1.222
P IV	0.020	0.1.222

Fifth leg (Fig. 29) with very prominent quadratic basiendopodite, bearing 6 strong long setae. Exopodite small, not reaching tip of basiendopodite, with 5 setae. Innermost seta having brush tip.

Male.—Average length 0.40 mm. Complete ventral spinulation on abdominal segments (Fig. 30). Antennula (Fig. 32) strongly prehensile. Only endopodite of P III dimorphic, with relatively large rounded terminal segment (Fig. 33); bearing 2 glandular structures. Processus of median segment relatively short, with simple ending. Fifth leg (Fig. 34) with plate-like reduced bare basiendopodite. Small quadratic exopodite bearing 4 setae.

Numerical relationship between sexes nearly equal.

Discussion.—We place the new species *Attheyella vera* in the subgenus *Canthosella* Chappuis. If one disregards the fact that the endopodites have a less reduced armature than the three Asian species included by Chappuis in this subgenus, our species conforms to the diagnosis of the subgenus. Petkovski (1973) described the Cuban *Canthosella antillica*, which occupies an intermediate place regarding the reduction of the number of endopodite setae. Our report of *Canthosella* is the first report of this subgenus from the South American continent. Ebert (1975) referred to a species of *Canthosella* found near Santarem, northern Brazil, apparently in bromeliads. The description of the males was incomplete, though some points of resemblance can be found. Unfortunately, since the material described in this thesis has not yet been prepared for publication, Ebert's species must be considered a nomen nudum.

ACKNOWLEDGEMENTS

The first author acknowledges a grant received from FAPESP (São Paulo) and from CNEN (Brasília-Rio de Janeiro). The junior author received a study grant from CNPq (Brasília). Both authors acknowledge help given by Dr. Vera L. Imperatriz Fonseca and Dr. Maria Carvalho, from the Department of General Ecology, Life Sciences Institute, University of São Paulo, as well as the facilities offered by Prof. L. Coutinho, head of this department.

Dr. B. Dussart (Les Eyzies) and Dr. G. Schriever (Kiel) supplied very useful information.

LITERATURE CITED

Ebert, S. 1976. Natürliches System und Biogeographie der Canthocamptidae (Copepoda, Harpacticoida) am Beispiel neotropischer Taxa.—Thesis, University of Kiel. Pp. 1–355.

- , and W. Noodt. 1975. Canthocamptidae aus Limnopsammon in Chile (Copepoda, Harpacticoida).—*Gewässer und Abwässer* 57–58: 121–141.
- Kiefer, F. 1967. Neue Harpacticoida aus dem Amazonasgebiet.—*Crustaceana* 13: 114–122.
- Lang, K. 1948. Monographie der Harpacticiden.—Pp. 1–168. Hakan Ohlson, Lund.
- Löffler, H. 1961. Zur Systematik und Ökologie der chilenischen Süßwasserentomostraken.—*Beiträge zur neotropischen Fauna* 2: 143–222.
- Petkovski, T. 1973. Subterrane Süßwasser Harpacticoida von Kuba (Vorläufige Mitteilung).—*Résultats des Expéditions Biospéologiques Cubano-Roumaines à Cuba*. Editura Academiei Republicii Socialiste România, pp. 125–141.
- Por, F. D., and V. L. Imperatriz Fonseca. 1984. The Juréia Ecological Reserve, São Paulo, Brazil - Facts and Plans.—*Environmental Conservation* 11: 67–70.
- Reid, J. W. 1984. Semiterrestrial meiofauna inhabiting a wet campo in central Brazil, with special reference to the Copepoda (Crustacea).—*Hydrobiologia* 118: 95–111.

RECEIVED: 17 May 1985.

ACCEPTED: 14 August 1985.

Addresses: (FDP) Department of Zoology, The Hebrew University, Jerusalem, Israel 91904; (VFH) CEBIMar, University of São Paulo, Brazil.