

A key to pupal exuviae of Neotropical Tanytarsini (Diptera: Chironomidae)

by

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Abstract

This study presents a key to pupal exuviae of the tribe Tanytarsini from the Neotropical region. Included are the 32 species from the Neotropics presently known as pupae, as well as 80 previously unpublished morphotypes from the Brazilian states Rio Grande do Sul and Amazonas. Detailed figures and distributional data are given for all morphotypes.

Keywords: **Chironomidae, Tanytarsini, pupal exuviae, key, Neotropics, Brazil.**

Resumo

Este estudo apresenta uma chave para exúvias de pupas da tribo Tanytarsini da região Neotropical. São incluídas 32 espécies atualmente conhecidas no estágio de pupa, assim como 80 novos morfotipos provenientes dos estados brasileiros Rio Grande do Sul e Amazonas. Figuras detalhadas e dados da distribuição também são fornecidos para todos os morfotipos.

Introduction

The family Chironomidae is frequently the most diverse and abundant group of insects in freshwater, and is a potentially useful group for bio-monitoring of freshwater environments on all continents. However, the lack of taxonomic knowledge at the species level and the difficult identification of immature stages often hinder efficient use of chironomids in limnology and applied ecology.

In Europe and North America pupal exuviae are extensively used in applied ecological studies, for example in bio-monitoring programmes and statements on water quality (LAVILLE & VIAUD-CHAUVET 1985; WILSON 1992; RUSE & WILSON 1995; WRIGHT et al. 1996; RUSE 1998), as well as in faunistic inventories (LAVILLE 1981; GENDRON & LAVILLE 1995; FRANQUET & PONT 1996; CRANSTON et al. 1997). Sampling and preparing pupal exuviae is easier than for larvae or adults (WILSON & BRIGHT 1973), and identification to species level is possible (LANGTON & VISSER 2003; WILSON 1996). However, at present pupal exuviae are used only occasionally in ecological studies in South America.

The taxonomic work necessary to reach species-level identification of Neotropical

chironomids is an enormous task. More than 800 Neotropical species are currently known, among them about 70 species belonging to the tribe Tanytarsini (SPIES & REISS 1996; SPIES pers. comm.). FITTKAU (1971, 1978) and FITTKAU & REISS (1979) estimated that this is only a small part of the real species richness and that more than a hundred new Tanytarsini species will be described mainly as a result of regional inventories, but also in connection with future taxonomic revisions.

SPIES & REISS (1996) listed 13 genera from the Neotropics that belong to the tribe Tanytarsini. The most species-rich genera are *Rheotanytarsus* THIENEMANN & BAUSE, *Caladomyia* SÅWEDAL and *Tanytarsus* VAN DER WULP. The genus *Rheotanytarsus* includes 19 described species from the Neotropical region and Mexico (SPIES & REISS 1996; KYEREMATEN et al. 2000; ANDERSEN & KYEREMATEN 2001; KYEREMATEN & ANDERSEN 2002). REIFF (2000) revised the genus *Caladomyia* and assigned 17 valid species to it. So far, 28 species of *Tanytarsus* are known from the region (SUBLETTE & SASA 1994; SPIES & REISS 1996; EKREM & REISS 1999; TRIVINHO-STRIXINO & SANSEVERINO 2003; SANSEVERINO et al. 2003; TRIVINHO-STRIXINO & STRIXINO 2004); the genus is being reviewed by SANSEVERINO.

According to SPIES & REISS (1996), the following genera are much less speciose (numbers of species in parenthesis): *Camposimyia* REISS (1), *Cladotanytarsus* KIEFFER (1), *Micropsectra* KIEFFER (1), *Paratanytarsus* THIENEMANN & BAUSE (2) and *Stempellina* THIENEMANN & BAUSE (2). Due to TRIVINHO-STRIXINO & SANSEVERINO (2003), a single validly named species currently remains in the genus *Nimbocera* REISS. Two species of *Skutzia* REISS are known from Brazil and Venezuela (REISS 1985; ANDERSEN 2000).

SÆTHER & ROQUE (2004) recently placed *Nandeva* WIEDENBRUG, REISS & FITTKAU in Tanytarsini; 5 Neotropical species of the genus have been described (WIEDENBRUG, REISS & FITTKAU 1998; SÆTHER & ROQUE 2004).

The genera *Constempellina* BRUNDIN, *Pontomyia* EDWARDS, *Stempellinella* BRUNDIN and *Sublettea* ROBACK were recorded from the Neotropical region as unnamed species (SPIES & REISS 1996; SÆTHER & ROQUE 2004).

If the metamorphosis of an established species is known, its pupal exuviae usually can be identified and labelled with a valid name. On the other hand, if the association with the adult stage is unknown, a morphological concept and provisional name can be used to define a pupal taxon at species- or species-group level. This 'morphotype' makes it possible to recognize and use the taxon in taxonomic, ecological and biogeographical studies even before the species is formally established and given a scientific name.

This paper presents a preliminary key to pupal exuviae of Brazilian and other Neotropical Tanytarsini species. Our intention is twofold: 1) to demonstrate the great species diversity of the tribe Tanytarsini in Brazil, and 2) to encourage researchers to further develop and improve taxonomic knowledge of species in this tribe by continuously adding descriptions of new species and morphotypes.

Material and methods

The material illustrated was collected at five localities in central Amazonia and at seven localities in Rio Grande do Sul state (Table 1). All specimens were collected with drift nets, preserved in 70 % ethanol and mounted in Euparal.

The key includes all the Neotropical Tanytarsini species for which pupal exuviae are known, and an additional 80 new morphotypes which are all illustrated. In many cases the genus concepts for pupal exuviae from the Neotropics are not yet well defined due to insufficient sampling and/or lack of knowledge about the immatures of many species. In these cases we decided to use a "?" in front of the genus name until more studies on all life stages will solve the taxonomic problems. With the present knowledge it is particularly difficult to separate pupal exuviae of the species-rich genera *Tanytarsus* and *Caladomyia*. In the latter, a mainly Neotropical genus, only four species are known as pupae. These show high interspecific character variation; a diagnosis for the pupae of *Caladomyia* is not yet possible. According to TRIVINHO-STRIXINO & SANSEVERINO (2003), the genus *Nimbocera* also lacks characters in the immature stages that would separate it from *Tanytarsus*.

The genera *Constempellina*, *Micropsectra*, *Pontomyia*, *Skutzia* and *Sublettea* have members in the Neotropics, the immature stages of these species are unknown; therefore these genera are not included in the key. No named species of the genus *Stempellinella* BRUNDIN have been described from the Neotropical region; however, two morphotypes belonging to this genus are keyed below.

The morphotypes included in this key were described by OSPINA-TORRES (1992) or WIEDENBRUG (2000). All specimens are deposited in the Instituto Nacional de Pesquisas da Amazonia (INPA) and the Zoologische Staatssammlung München (ZSM). A complete list of the examined material, the names assigned to the various morphotypes in previous studies, the sampling localities and habitat is given in Table 1. The morphological terminology and abbreviations follow SÆTHER (1980), with modifications given by LANGTON (1991), except that we use the term 'prealar tubercle' after COFFMAN (1986) for the bulbous swelling anterior to the wing sheath base. The term 'chaetae' is used for the fine ramifications of the thoracic horn, following PINDER & REISS (1986). The term 'taeniae' denotes the flattened setae on the pupal abdomen (LANGTON 1994). 'Scutal tubercle' is applied as in the adult stage (see SÆTHER 1980). All scale bars in the illustrations correspond to 100 µm. In several drawings of the abdomen (e.g., Fig. 20I), not all details of segments VIII and IX are figured, since these are shown in separate illustrations (e.g., Fig. 20L).

Key to pupal exuviae of Tanytarsini from Brazil, including additional valid species from elsewhere in the Neotropical Region

1. Thoracic horn simple, bare or with short spines or long chaetae and with dome-like base, seldom absent. Wing sheaths usually with nose. Hook row present on segment II; tergites (II)III-V(VII) often with a pair of anterior patches of points, spines or spinules. Posterolateral corners of segment VIII usually with, rarely without, a spur or comb. Anal lobe rounded, without macrosetae, usually with fringe and 0-2 dorsal taeniae 2
 Not as above not keyed
2. -Hook row present on tergites II-V, thoracic horn, spur or comb on posterolateral corners of segment VIII, and anal lobe fringe absent 3
 -Character combination not as above 5
3. -TIII-VII with paired point patches fused or almost fused (WIEDENBRUG, REISS & FITTKAU 1998, Fig. 5H) *Nandeva chilena* WIEDENBRUG, REISS & FITTKAU, 1998
 -TIII-VII with paired point patches clearly separate 4
4. -TII-VI with posterior band of clearly defined polygons, each polygon usually ending in 1 spine (WIEDENBRUG, REISS & FITTKAU 1998, Fig. 5F)
 *Nandeva gaucha* WIEDENBRUG, REISS & FITTKAU, 1998
 -TII-VI with posterior band of diffuse polygons, each polygon usually ending in 2-4 spines (WIEDENBRUG, REISS & FITTKAU 1998, Fig. 5B)
 *Nandeva tropica* WIEDENBRUG, REISS & FITTKAU, 1998
5. -Thoracic horn with long chaetae AND TIII-V with paired point patches (Figs. 1B, 1C) 6
 -Not as above 7
6. -Thoracic horn short and club shaped, with chaetae over apical 1/3 (DARBY 1962, Fig. 146) ...
 *Cladotanytarsus cf. viridiventris* (MALLOCH, 1915)

- Thoracic horn narrow, elongate, with chaetae starting at base ?*Cladotanytarsus* sp. 1 (Fig. 1A-F)
7. -TIV with an anterior single point patch OR with paired point patches and inverted L-shaped bands of long spines (Fig. 1K) 8
 -TIV not as above 10
8. -TIII with a single anteromedian patch of spinules. Spur of segment VIII preceded by smaller spines (REISS 1972, Figs. 3, 4) *Camposimyia echinata* (REISS, 1972)
 -Character combination not as above 9
9. -Thoracic horn present. TII and III with longitudinally elongated paired point patches. TIV and V with paired point patches and inverted L-shaped paired bands of long spines. Comb of segment VIII with two teeth ?*Paratanytarsus* sp. 1 (Fig. 1G-M)
 -Thoracic horn absent. TII evenly covered with shagreen, TIII with long spine bands in posterior half, TIV with single anteromedian point patch and paired bands of long spines. Comb of segment VIII with more than two teeth (LANGTON 1991, plate 132, Fig. i)
 *Paratanytarsus grimmii* (SCHNEIDER, 1885)
10. -TIV with paired longitudinal bands including some medially and some orally directed spines (Fig. 2J), AND TI with all D-setae much shorter than half of the segment 11
 -IF spine bands on TIV include medially directed spines, THEN TI always with two taeniate D-setae longer than half of the segment 12
11. -TVIII with four taeniate L-setae (REISS 1972, Figs. 7, 8) . *Nimbocera patagonica* REISS, 1972
 -TVIII with three taeniate L-setae (TRIVINHO-STRIXINO & SANSEVERINO 2003, Figs. 6-9)
 *Tanytarsus rhabdomantis* (TRIVINHO-STRIXINO & STRIXINO, 1991) and *Tanytarsus* sp. 1* (Fig. 2E-L)
12. -Segment VIII with anal spur, with one or two additional basal spines; IF comb with two teeth present (Fig. 4H), THEN TV-VI with paired fields of dark reticulation (Fig. 4G). 13
 -Segment VIII with comb; IF spur present, THEN TII-TIII with a more or less rectangular field of shagreen including at least setae D1 and D5 (Fig. 7C) 24
13. -Tergites with homogeneous shagreen or with points/spinules increasing in size posteriad; anterior paired point patches and paired longitudinal bands of spines absent 14
 -Anterior paired point patches or paired longitudinal bands of points or spines present on at least TII-IV 17
14. -Frontal apotome and anterior 1/2 of thorax strongly granulose (Fig. 2A). Thoracic horn relatively thick, 5-8 times as long as wide. 15
 -Frontal apotome and anterior 1/2 of thorax smooth or weakly granulose (Fig. 3B) Thoracic horn relatively slender, 13-16 times as long as wide. 16
15. -Dc1 and Dc2 very long. Scutal tubercle absent *Stempellina* sp. 1 (Fig. 2A-D)
 -Dc1 much shorter than Dc2. Scutal tubercle present (SÄWEDAL 1984, Figs. 6-7)
 *Stempellina tarumai* SÄWEDAL, 1984
16. -Segment VIII with 2 taeniate L-setae *Stempellinella* sp. 1 (Fig. 3A-C)
 -Segment VIII with 3 taeniate L-setae *Stempellinella* sp. 2 (Fig. 3D-G)
17. -TIV-VII with paired fields of dark-coloured reticulation (Fig. 4G). In addition, Shagreen present on TV-VI, absent on TVII *Rheotanytarsus* sp. 1 (Fig. 4A-H)
 -TIV-VII not as above 18
18. -Three taeniate L-setae on segment VIII. Frontal apotome very granulose
 *Rheotanytarsus* sp. 2 (Fig. 4I-P)
 -Four or five taeniate L-setae on segment VIII. Frontal apotome with or without granulation 19
19. -Tergite VI with 3 taeniate L-setae; TII-IV with anterior paired point patches, TV-VI without anterior paired point patches
 *Rheotanytarsus contrerasi* ANDERSEN & SÆTHER in KYEREMATEN et al. 2000
 -Tergite VI with 4 taeniate L-setae; anterior paired point patches present on TV or TV and TVI.
 20

20.	-Anterior paired point patches on TII-VI (KYEREMATEN & ANDERSEN 2002, Figs. 87-90)	<i>Rheotanytarsus exiguus</i> (JOHANNSEN, 1905)	
	-Anterior paired point patches on TII-V		21
21.	-Segment VIII with 5 taeniate L-setae	<i>Rheotanytarsus globosus</i> REISS, 1972	
	-Segment VIII with 4 taeniate L-setae		22
22.	-Hook row on TII with less than 30 hooklets	<i>Rheotanytarsus hamatus</i> SUBLETTE & SASA, 1994	
	-Hook row on TII with more than 30 hooklets		23
23.	-Frontal apotome rugulose anteriorly. Shagreen on TII restricted to posterior area between setae D5 (KYEREMATEN & ANDERSEN 2002, Figs. 87-90)	<i>Rheotanytarsus ramirezae</i> KYEREMATEN & ANDERSEN, 2002	
	-Frontal apotome not rugulose. Shagreen on TII fine, extending into anterior half of tergite (Fig. 5C)	<i>Rheotanytarsus</i> sp. 3 (Fig. 5A-F)	
24.	-Anal lobe with one dorsal taenia		25
	-Anal lobe with two dorsal taeniae		27
25.	-TII with paired anterior transverse point patches. Taeniate L-setae present only on segment VIII	? <i>Rheotanytarsus</i> sp. 4 (Fig. 5G-L)	
	-TII without paired point patches		26
26.	-Thoracic horn with long chaetae and short spines (Fig. 6C)	<i>Tanytarsus</i> sp. 2 (Fig. 6A-F)	
	-Thoracic horn bare	<i>Tanytarsus</i> sp. 3 (Fig. 6G-J)	
27.	-Tergites III and IV with shagreen only, without paired point patches or spine bands (Figs. 7-8). Segment V always with taeniate L-setae		28
	-TIII and/or TIV usually with point patches or spine bands, IF with shagreen only, THEN segment V without taeniate L-setae		35
28.	-Segment IV with 3 taeniate L-setae (TRIVINHO-STRIXINO & STRIXINO 2000, Figs. 7-9)	<i>Caladomyia friederi</i> TRIVINHO-STRIXINO & STRIXINO, 2000	
	-Segment IV without taeniate L-setae		29
29.	-Tergites II-IV with anterior band of stronger shagreen merging with a median field of finer shagreen (SANSEVERINO et al. 2003, Fig. 8)	<i>Tanytarsus xingu</i> SANSEVERINO, WIEDENBRUG & FITTKAU, 2003	
	-Tergites II-IV with shagreen relatively homogeneous, anterior band not differentiated		30
30.	-Tergite armature formed of separate, single points (Fig. 7J).		31
	-Tergite armature formed of groups or rows of 3-4 small points each (Fig. 8G)		32
31.	-Segment VII armed with fine shagreen (SANSEVERINO et al. 2003, Fig. 4)	<i>Tanytarsus revolta</i> SANSEVERINO, WIEDENBRUG & FITTKAU, 2003 and <i>Tanytarsus</i> sp. 4* (Fig. 7A-E)	
	-Segment VII unarmed	<i>Tanytarsus</i> sp. 5 (Fig. 7F-J)	
32.	-Segment VIII with five taeniate L-setae	<i>Tanytarsus</i> sp. 6 (Fig. 8A-D)	
	-Segment VIII with four taeniate L-setae (Fig. 8F)		33
33.	-Hook row about 1/3 of segment II width	<i>Tanytarsus</i> sp. 7 (Fig. 8E-G)	
	-Hook row about 1/5 of segment II width		34
34.	-Segment VIII with a spur and several adjacent spinules decreasing in size anteriorly (SANSEVERINO et al. 2003, Fig. 2)	<i>Tanytarsus marauia</i> SANSEVERINO, WIEDENBRUG & FITTKAU, 2003	
	-Segment VIII with a spur and few very small adjacent spinules (SANSEVERINO et al. 2003, Fig. 6)	<i>Tanytarsus waika</i> SANSEVERINO, WIEDENBRUG & FITTKAU, 2003	
35.	-D-setae on TI taeniate and very long (Fig. 9C); Comb of segment VIII wide, marginal teeth equally long (Fig. 9D); three taeniate L-setae on segment VIII.		36
	-Character combination not as above		44

36.	-Pedes spurii B on segment II apically with fine spinules (Fig. 9C, detail)	37
	- Pedes spurii B on segment II without spinules.	40
37.	-TIII without paired longitudinal bands of spines, with shagreen only	
 <i>Tanytarsus</i> sp. 8 (Fig. 9A-D)	
	-TIII with paired longitudinal bands of spines (Fig. 9G)	38
38.	-Sternite I without anterior patches of fine spinules. TIII with paired longitudinal bands of short spines approximately as long as spines on TIV	<i>Tanytarsus</i> sp. 9 (Fig. 9E-H)
	-Sternite I with anterior paired patches of fine spinules (Fig. 10E). TIII with paired longitudinal bands of long spines longer than spines on TIV (Fig. 10J)	39
39.	-Conical prealar tubercle present (Fig. 10B)	<i>Tanytarsus</i> sp. 10 (Fig. 10A-E)
	-Prealar tubercle absent (Fig. 10G)	<i>Tanytarsus</i> sp. 11 (Fig. 10F-G)
40.	-Longitudinal bands of TIV joined by anterior band of spines	<i>Tanytarsus</i> sp. 12 (Fig. 10H-K)
	-Longitudinal bands of TIV separate (Fig. 11C)	41
41.	-Longitudinal bands on TIV of points straight, diverging posteriorly	
 <i>Tanytarsus</i> sp. 13 (Fig. 11A-D)	
	-Longitudinal bands on TIV of long spines forming anteriorly angled lines (Fig. 12C)	42
42.	-Longitudinal bands of spines on TV anteriorly angled, longer than 1/2 of segment	
 <i>Tanytarsus</i> sp. 14 (Fig. 11E-K)	
	-Longitudinal bands of spines on TV shorter than 1/2 of segment, straight	43
43.	-Median and posterior portions of spines bands on TIV with small, conical spinules (SANSEVERINO & WIEDENBRUG 2000, Fig. 1)	<i>Tanytarsus cuieirensis</i> FITTKAU & REISS, 1973
	-All spines in bands on TIV of uniform shape (Fig. 12C)	<i>Tanytarsus</i> sp. 15 (Fig. 12A-D)
44.	-Three taeniate L-setae present on segment VIII AND frontal warts well developed (Fig. 13A)	45
	-Four or five taeniate L-setae present on TVIII. Frontal warts present or absent	46
45.	-Prealar tubercle without a finger-like projection. TVIII with a small field of fine shagreen. Comb of segment VIII with 5-7 marginal teeth	<i>Tanytarsus</i> sp. 16 (Fig. 12E-H)
	-Prealar tubercle with thin, finger-like projection. TVIII with stronger shagreen in an extensive field. Comb of segment VIII with 8 or more marginal teeth	<i>Tanytarsus</i> sp. 17 (Fig. 13A-E)
46.	-Anterior paired point patches present on TII	47
	-Anterior paired point patches absent on TII, shagreen present or absent	51
47.	-TIII with paired bands of long spines	<i>Tanytarsus hastatus</i> SUBLETTE & SASA, 1994
	-TIII with paired point patches only (Fig. 13H)	48
48.	-TII and TIII with shagreen between point patches	49
	-TII and TIII without shagreen between point patches	50
49.	-Seta Pc3 not longer than other precorneals. Tergal point patches not clearly differentiated from surrounding shagreen. Comb of segment VIII with 7-8 strong marginal teeth. Anal lobe with complete fringe	<i>Tanytarsus</i> sp. 18 (Fig. 13F-N)
	-Pc3 extremely long, almost as long as thoracic horn. Point patches clearly differentiated. Comb of segment VIII with 4-5 marginal teeth. Anterior 1/4 of anal lobe without fringe	<i>Tanytarsus</i> sp. 19 (Fig. 14A-I)
50.	-Frontal warts distinct. Tergite II with bands of fine shagreen lateral to point patches	
 <i>Tanytarsus</i> sp. 20 (Fig. 14J-L)	
	-Frontal warts absent. Tergite II without bands of fine shagreen lateral to point patches	
 <i>Tanytarsus</i> sp. 21 (Fig. 15A-I)	
51.	-TIII with paired bands of usually long spines, bands either stretch from anterior to posterior half of segment, OR paired bands or point patches lie entirely within posterior half of segment	52
	-TIII bare, OR with shagreen only, OR with armature (paired point or spine patches, anterior transverse band of stronger spinules or spines) entirely within anterior half of segment	87
52.	-TIII with rounded paired point patches restricted to posterior half of segment. Comb of segment VIII as in SÄWEDAL (1981, Figs. 8-10)	<i>Caladomyia spixi</i> SÄWEDAL, 1981

	-TIII with paired elongate bands of usually long spines (Fig. 16C)	53
53.	-Segment VII with four taeniate L-setae situated in posterior half of segment. Pleura very wide (Fig. 28I)	83
	-IF four taeniate L-setae on segment VII, THEN setae evenly distributed. Pleura normally wide (Fig. 16H)	54
54.	-Segment VIII with four taeniate L-setae	55
	-Segment VIII with five taeniate L-setae	59
55.	-TIII-VI with long, oblique spine bands with shagreen in between <i>Tanytarsus</i> sp. 22 (Fig. 15J-N)	
	-If long, oblique spine bands present, THEN no shagreen in between	56
56.	-Hook row on TII about 1/2 of segment width. TIV with paired patches of points and short spines. TV-VI with point patches with basally joined points <i>Tanytarsus</i> sp. 23 (Fig. 16A-D)	
	-Hook row on TII shorter than 1/2 of segment width. Armature of TIV-VI not as above	57
57.	-Segment VII with 3 L-setae not taeniate (SUBLETTE & SASA 1994, Fig. 198)	
 <i>Tanytarsus pandus</i> SUBLETTE & SASA, 1994	
	-Segment VII with 4 L-setae that may be taeniate (Fig. 16H)	58
58.	-Prealar tubercle without finger-like projection. TV with long oblique bands of points, without shagreen lateral to the bands. <i>Tanytarsus</i> sp. 24 (Fig. 16E-J)	
	-Prealar tubercle with finger-like projection. TV with patches of short spines and laterally adjacent shagreen <i>Tanytarsus</i> sp. 25 (Fig. 17A-E)	
59.	-Prealar tubercle conspicuous and anvil-shaped (REISS 1972, Fig. 24)	
 <i>Tanytarsus rinihuensis</i> REISS, 1972	
	-Prealar tubercle differently shaped or absent	60
60.	-Hook row wider than 3/4 of segment II. Segment IV with one long taenia between at least two simple L-setae. Paired point patches on TV or TVI usually with points or spinulae fused at their bases, forming short rows of three points or more. IF hook row only slightly wider than 1/2 of segment, THEN conical cephalic tubercles present	79
	-Hook row not wider than 1/2 of segment II. IF segment IV with lateral setation as above, THEN conical cephalic tubercles absent. TV and TVI with or without basally joined points	61
61.	-Bands of long spines on TIV anteriorly curved or angled toward each other. (Figs. 17H, 18C, 18I, 19G)	62
	-Bands of long spines, when present, not as above	66
62.	-Cephalic tubercle conical. Shape and length of the bands of spines on TIV subequal to bands of spines on TV (TRIVINHO-STRIXINO & STRIXINO 2003, Figs. 1-4)	
 <i>Caladomyia ortonii</i> SÄWEDAL, 1981	
	-Cephalic tubercle not conical. Bands of spines on TIV usually longer than point patches or bands on TV	63
63.	-Bands of long spines on TIV anteriorly fused forming an inverted U. TV bands strongly convergent anteriorly but not fused. Anteprepronotum laterally with points near lateral anteprepronotals (Fig. 17G) <i>Tanytarsus</i> sp. 26 (Fig. 17F-I)	
	-Bands on TIV anteriorly not fused. TV and TVI with paired point patches. Anteprepronotum not as above	64
64.	-TIV with long spines in oblique and straight bands. Shagreen on TII stronger anteriorly	
 ? <i>Caladomyia</i> sp. 1 (Fig. 18A-F)	
	-TIV with inverted L-shaped bands of long spines. Shagreen on TII not stronger anteriorly (Figs. 18I, 19G)	65
65.	-Frontal wart present. Comb of segment VIII with subequal marginal teeth and a lateral tooth at least twice as large as the others (Fig. 18J) ? <i>Caladomyia</i> sp. 2 (Fig. 18G-J)	
	-Frontal wart absent. Comb of segment VIII with lateralmost tooth not much larger than others (Fig. 19I) <i>Tanytarsus</i> sp. 27 (Fig. 19E-I)	
66.	-Frontal wart present, large and rounded. Shagreen on TII separated into anterior and posterior patches <i>Tanytarsus</i> sp. 28 (Fig. 19A-D)	

	-Frontal wart absent. TII not as above	67
67.	-TIV with paired point patches or paired bands of spines, without adjacent shagreen fields (Figs. 20C, 20I, 21C, 21G)	68
	-TIV with paired point patches or paired bands of spines, with adjacent shagreen fields (Figs. 22, 23, 24, 25C)	73
68.	-Spines on TIII much longer than on TV and TVI (Figs. 20C, 20I)	69
	-Spines on TIII-TVI subequal in size (Figs. 21C, 21G)	72
69.	-TV and TVI with points or spinulate points fused at their base to form short rows of three or more points (Figs. 20J-K)	71
	-TV and TVI with simple points	70
70.	-Point patches on TVI with at most 10 points. TVI with 3 simple L-setae (REISS 1972, Fig. 16 c)	<i>Tanytarsus hamatus</i> REISS, 1972
	-Point patches on TVI with more than 10 points. TVI with 3 taeniate L-setae (REISS 1972, Fig. 14 b, c)	<i>Tanytarsus clivosus</i> REISS, 1972
71.	-TIV with bands of short spines; Spines on TIV clearly smaller than those on TIII	? <i>Caladomyia</i> sp. 3 (Fig. 20G-L)
	-TIV with bands of long spines, that are subequal to those on TIII	? <i>Caladomyia</i> sp. 4 (Fig. 20A-F)
72.	-Conical cephalic tubercle present	<i>Tanytarsus</i> sp. 29 (Fig. 21A-D)
	-Cephalic tubercle absent	<i>Tanytarsus</i> sp. 30 (Fig. 21E-L)
73.	-Bands on TIII and TIV with spines subequal in size (Fig. 22C)	74
	-Bands on TIII with spines clearly longer than those on TIV (Fig. 23G)	76
74.	-TIII shagreen fields lateral of spine bands with anterior shagreen points clearly stronger. TIV without taeniate L-seta	<i>Tanytarsus fastigatus</i> REISS, 1972 (part, see couplet 97) (REISS 1972, Fig. 18 b-d) and <i>Tanytarsus</i> sp. 31* (Fig. 22A-G)
	-TIV with at least one taeniate L-seta. Shagreen lateral to spine bands on TIII homogeneous (Fig. 22H)	75
75.	-Bands on TIII and TV with relative small spines subequal in size	<i>Tanytarsus</i> sp. 32 (Fig. 22H-K)
	-Spines on TV much smaller than in bands on TIII and TIV	<i>Tanytarsus</i> sp. 33 (Fig. 23A-E)
76.	-TIII with spine bands restricted to posterior 1/2 of tergite. TVI with anterior fields of fine shagreen	<i>Tanytarsus</i> sp. 34 (Fig. 23F-J)
	-TIII with spine bands extending from anterior to posterior 1/2 of tergite. TVI with paired point patches, the points as strong as on TV (Fig. 24C)	77
77.	-TIV-V with shagreen lateral to point patches, extending posteriad. TIII with shagreen between longitudinal spine bands	<i>Tanytarsus</i> sp. 35 (Fig. 24A-F)
	-TIV-V with shagreen restricted to a field posterior to the paired point patches. TIII without shagreen between longitudinal bands	78
78.	-Cephalic tubercle conical	<i>Tanytarsus</i> sp. 36 (Fig. 24G-K)
	-Cephalic tubercle weak, rounded	<i>Tanytarsus</i> sp. 37 (Fig. 25A-E)
79.	-Spine bands on TIII posteriorly clearly curved outwards at an almost 90° angle; spine bands on TIV obliquely set, approaching each other posteriorly (Fig. 26J)	80
	-Spine bands on TIII oblique; on TIV nearly parallel (Fig. 27J)	82
80.	-Bands on TIV of short, medially directed spines only	? <i>Caladomyia</i> sp. 5 (Fig. 25F-J)
	-Bands on TIV with some long spines, at least anteriorly	81
81.	-Bands on TIV with long spines limited to anterior section	? <i>Caladomyia</i> sp. 6 (Fig. 26A-G)
	-Band on TIV with long spines only	? <i>Caladomyia</i> sp. 7 (Fig. 26H-M)
82.	-TIV with paired bands of long spines	? <i>Caladomyia</i> sp. 8 (Fig. 27A-G)
	-TIV with paired bands of points (REISS 1972, Fig. 26 c, d)	<i>Tanytarsus tuberculatus</i> REISS, 1972 and ? <i>Caladomyia</i> sp. 9* (Fig. 27H-P)
83.	-Wing sheath with an anterior marginal small tubercle (Fig. 28B, 28F)	84

	-Wing sheath without such a tubercle	85
84.	-Prealar tubercle absent	<i>Tanytarsus</i> sp. 38 (Fig. 28A-E)
	-Prealar tubercle with a finger-like projection	<i>Tanytarsus</i> sp. 39 (Fig. 28F)
85.	-Prealar tubercle with a finger-like projection	<i>Tanytarsus</i> sp. 40 (Fig. 28G-J)
	-Prealar tubercle at most weakly swollen	86
86.	-TIV and TV with shagreen in addition to the paired point patches. Spine bands on TIII situated at mid-tergite	<i>Tanytarsus</i> sp. 41 (Fig. 29A-F)
	-TIV and TV without shagreen. Spine bands on TIII situated posteriorly	<i>Tanytarsus</i> sp. 42 (Fig. 29G-I)
87.	-Segment VIII with five taeniate L-setae	88
	-Segment VIII with four taeniate L-setae	100
88.	-TIII and TIV with anterior transverse band of stronger shagreen, or paired point patches which are wider than long. Usually 2 precorneals much longer than third. Comb of segment VIII with wide-based teeth giving the comb a bulky appearance (Fig. 30G)	89
	-Point patches on TIII and TIV, when present, rounded or elongate. Usually all precorneals subequal in length. Comb of segment VIII not as above	92
89.	-TII with homogeneous shagreen	<i>Tanytarsus</i> sp. 43 (Fig. 30A-G)
	-TII with shagreen stronger anteriorly (Fig. 31C), or restricted to an anterior band	90
90.	-TII-IV with shagreen restricted to an anterior band	<i>Tanytarsus</i> sp. 44 (Fig. 30H-K)
	-TII-IV with shagreen extending into posterior halves of tergites (Fig. 31C)	91
91.	-TIII-VI with a continuous anterior transverse band of strong shagreen	<i>Tanytarsus</i> sp. 45 (Fig. 31A-D)
	-TIII-VI with medially divided anterior transverse bands of strong shagreen, forming paired shagreen patches	<i>Tanytarsus</i> sp. 46 (Fig. 31E-I)
92.	-TIII with shagreen only (Fig. 32I)	93
	-TIII with anterior paired point patches (Fig. 34K)	94
93.	-TIII with a median longitudinal bare field. Two precorneals at least as long as the thoracic horn. TIV-VI with anterior paired point patches	<i>Tanytarsus</i> sp. 47 (Fig. 32A-F)
	-TIII with an undivided field of shagreen. Precorneals subequal in length, shorter than thoracic horn. TIV-V with anterior paired point patches, TVI with anterior paired shagreen fields	<i>Tanytarsus</i> sp. 48 (Fig. 32G-L)
94.	-TVII with three taeniate L-setae (TRIVINHO-STRIXINO & STRIXINO 2003, Figs. 7-11)	<i>Caladomyia riotarumensis</i> REIFF, 2000
	-TVII with four taeniate L-setae (Fig. 33J)	95
95.	-TVI with shagreen only, without paired point patches, TIII with three L-setae increasing in size posteriad. TIV with three taeniate L-setae subequal to those on TV	<i>Tanytarsus</i> sp. 49 (Fig. 33A-G)
	-TVI with paired point patches and additional shagreen. TII-IV with simple L-setae or taeniate L-setae not as above	96
96.	-TIII-V with very fine shagreen reaching lateral apodemes	<i>Tanytarsus</i> sp. 50 (Fig. 33H-M)
	-If very fine shagreen present on TIII-V, it is not reaching lateral apodemes	97
97.	-TIII-VI with point patches usually medially with at least a few long spines or elongate spinules medially (REISS 1972, Fig. 18 b-d)	<i>Tanytarsus fastigatus</i> REISS, 1972 (part, see couplet 74)
	-Point patches on TIII-VI of short points only (Fig. 34C)	98
98.	-Two precorneals almost as long as thoracic horn	<i>Tanytarsus</i> sp. 51 (Fig. 34A-H)
	-All precorneals distinctly shorter than thoracic horn (Fig. 34J)	99
99.	-Frontal apotome granulated (Fig. 34I)	<i>Tanytarsus</i> sp. 52 (Fig. 34I-P)
	-Frontal apotome smooth (Fig. 35A)	<i>Tanytarsus</i> sp. 53 (Fig. 35A-D)
100.	-TIV-V with paired point patches and additional shagreen (Fig. 35G)	101
	-TIV-V with paired point patches, without additional shagreen (Fig. 37G)	104
101.	-Parasternite VIII with shagreen field continuous with the comb armature (Fig. 35L)	102

-Parasternite VIII not as above	103
102. -Frontal wart present, long and conical. Thoracic horn distally bare. Comb of segment VIII as in Fig. 35L. Segment VIII not distinctly pigmented	<i>Tanytarsus</i> sp. 54 (Fig. 35E-L)
-Frontal wart absent. Thoracic horn with short chaetae distally. Comb of segment VIII as illustrated in Fig. 36H. Segment VIII strongly pigmented	<i>Tanytarsus</i> sp. 55 (Fig. 36A-H)
103. -Hook row not longer than 1/4 segment width. Shagreen on TII restricted to posterior half of tergite. TIV with simple L-setae only	<i>Tanytarsus</i> sp. 56 (Fig. 36I-N)
-Hook row about 1/2 segment width. Shagreen on TII not restricted to posterior half of tergite. TIV with one taeniata L-seta	<i>Tanytarsus</i> sp. 57 (Fig. 37A-D)
104. -TIII without any armature (Fig. 37G)	105
-TIII with paired point patches (Fig. 38J)	106
105. -Comb of segment VIII with at least eight marginal teeth	<i>Tanytarsus</i> sp. 58 (Fig. 37E-H)
-Comb of segment VIII with at most 3 marginal teeth	<i>Tanytarsus</i> sp. 59 (Fig. 38A-G)
106. -TII without shagreen	<i>Tanytarsus</i> sp. 60 (Fig. 38H-O)
-TII with shagreen (Fig. 39C)	107
107. -Frontal warts bent inwards and touching at apex (TRIVINHO-STRIXINO & STRIXINO 2004, Fig. 6)	108
-Frontal wart absent (Fig. 39A)	109
108. -TIII with bands of fine shagreen lateral to point patches (TRIVINHO-STRIXINO & STRIXINO 2004, Fig. 5)	<i>Tanytarsus magnus</i> TRIVINHO-STRIXINO & STRIXINO, 2004
-TIII with paired point patches only	<i>Tanytarsus impar</i> TRIVINHO-STRIXINO & STRIXINO, 2004
109. -TII-IV with at least one L-seta in the anterior half of the segment	<i>Tanytarsus</i> sp. 61 (Fig. 39A-F)
-TII-IV with all L-setae in the posterior half of the segment	<i>Tanytarsus</i> sp. 62 (Fig. 39G-N)

* May be a single species, but the known material is inconclusive

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Table 1: Brazilian material examined. Abbreviations: A. = Arroio, AM = Amazonas, ET = "Puppenexuvien Typ" (exuviae type), F. = E.J. Fittkau, Ig. = Igarapé, O = R. Ospina-Torres (1992), R. = "Reserva", RS = Rio Grande do Sul, S.F. = São Francisco de, W = S. Wiedenbrug (2000).

Species name	Fig.	Author: name in the reference	Locality - collector (sample number) - habitat
? <i>Caladomyia</i> sp. 1	18	O: ET 86	AM, Manaus, R. Duke, Ig. Acará. - F. (A-192) - stream
? <i>Caladomyia</i> sp. 2	18	W: <i>Tanytarsus</i> sp. 1	RS, S.F. Paula, A. dos Carros. - F., W. - stream

Species name	Fig.	Author: name in the reference	Locality - collector (sample number) - habitat
? <i>Caladomyia</i> sp. 2	18	W: <i>Tanytarsus</i> sp. 1	"RS, Taquara, A. do Mineiro. - F., W. - stream
? <i>Caladomyia</i> sp. 3	20	O: ET 96	AM, Manaus, R. Duke, Ig. Gigante. - F. (A-198 4/5) - stream/waterfall
"	"	"	AM, Manaus, R. Duke, Ig. Acará. - F. (A-192) - stream
? <i>Caladomyia</i> sp. 4	20	O: ET 84	AM, Manaus, R. Duke, Ig. Acará. - F. (A-192) - stream
"	"	"	AM, Manaus, R. Duke, Ig. Barro Branco. - F. (A-174-3) - stream
? <i>Caladomyia</i> sp. 5	25	O: ET 95	AM, Manaus, R. Duke, Ig. Barro Branco. - F. (A-174-3) - stream
? <i>Caladomyia</i> sp. 6	26	W: <i>Tanytarsus</i> sp. 8	RS, Taquara, A. do Mineiro. - F., W. - stream
? <i>Caladomyia</i> sp. 7	26	O: ET 88	AM, Manaus, R. Duke, Ig. Acará. - F. (A-192) - stream
? <i>Caladomyia</i> sp. 8	27	W: <i>Tanytarsus</i> sp. 7	RS, S. F. Paula, A. dos Carros. - F., W. - stream
? <i>Caladomyia</i> sp. 9	27	W: <i>Tanytarsus</i> sp. 14	RS, S. F. Paula, Pró-Mata. - F., W. - pond
? <i>Cladotanytarsus</i> sp. 1	1	W: <i>Cladotanytarsus</i> sp. 1	RS, Cidade de Mato Leitão, A. do Sampaio. - F., W. - stream
? <i>Paratanytarsus</i> sp. 1	1	W: <i>Paratanytarsus</i> sp. 1	RS, Cidade de Mato Leitão, A. do Sampaio. - F., W. - stream
<i>Rheotanytarsus</i> sp. 1	4	W: <i>Rheotanytarsus</i> sp. 3	RS, Cidade de Mato Leitão, A. do Sampaio. - F., W. - stream
<i>Rheotanytarsus</i> sp. 2	4	O: ET 81	AM, Manaus, R. Duke, Ig. Gigante. - F. (A-198 4/5) - stream/waterfall
<i>Rheotanytarsus</i> sp. 3	5	O: ET 80	AM, Manaus, R. Duke, Ig. Acará. - F. (A-192) - stream
? <i>Rheotanytarsus</i> sp. 4	5	W: <i>Rheotanytarsus</i> sp. 2	RS, Taquara - F., W. - stream/waterfall.
<i>Stempellina</i> sp. 1	2	O: ET 82	AM, Manaus, R. Duke, Ig. Acará. - F. (A-192) - stream
<i>Stempellinella</i> sp. 1	3	O: ET 83	AM, Manaus, R. Duke, Ig. Carangeju. - F. (A-181-1) - stream
<i>Stempellinella</i> sp. 2	3	W: <i>Stempellinella</i> sp. 1	RS, Taquara, A. do Mineiro.- F., W. - stream
<i>Tanytarsus</i> sp. 1	2	W: <i>Nimbocera</i> sp. 1	RS, S. F. Paula, Pró-Mata. - F., W. - springbrook
<i>Tanytarsus</i> sp. 2	6	W: Genus 9 sp. 1	RS, S. F. Paula, A. dos carros. - F., W. - stream
<i>Tanytarsus</i> sp. 3	6	O: ET 101	AM, Manaus, R. Duke, Ig. Acará. - F. (A-192) - stream
"	"	"	AM, Manaus, R. Duke, Ig. Gigante. - F. (A-198 4/5) - stream/waterfall
<i>Tanytarsus</i> sp. 4	7	W: Gen. 10 sp. 1	RS, Cidade de Mato Leitão, A. do Sampaio. - F., W. - stream
<i>Tanytarsus</i> sp. 5	7	O: ET 127	AM, Manaus, R. Duke, Ig. Barro Branco. - F. (A-174-3). - stream
<i>Tanytarsus</i> sp. 6	8	O: ET 126	AM, Manaus, R. Duke, Ig. Acará. - F. (A-192) - stream
<i>Tanytarsus</i> sp. 7	8	O: ET 128	AM, Manaus, R. Duke, Ig. Acará. - F. (A-192) - stream

Species name	Fig.	Author: name in the reference	Locality - collector (sample number) - habitat
<i>Tanytarsus</i> sp. 7	8	O: ET 128	"AM, Manaus, R. Duke, Ig. Tarumã. - F. (A 190) - stream
<i>Tanytarsus</i> sp. 8	9	O: ET 138	AM, Manaus, R. Duke, Ig. Acará. - F. (A-192) - stream
<i>Tanytarsus</i> sp. 9	9	O: ET 136	AM, Manaus, R. Duke, Ig. Acará. - F. (A-192) - stream
"	"	"	AM, Manaus, R. Duke, Ig. Gigante. - F. (A-198 4/5) - stream/waterfall
<i>Tanytarsus</i> sp. 10	10	O: ET 134	AM, Manaus, R. Duke, Ig. Barro Branco. - F. (A-174-3) - stream
"	"	"	AM, Manaus, R. Duke, Ig. Carangeju. - F. (A-181-1) - stream
<i>Tanytarsus</i> sp. 11	10	O: ET 135	AM, Manaus, R. Duke, Ig. Acará. - F. (A-192) - stream
<i>Tanytarsus</i> sp. 12	10	O: ET 137	AM, Manaus, R. Duke, Ig. Carangeju. - F. (A-181-1) - stream
<i>Tanytarsus</i> sp. 13	11	O: ET 132	AM, Manaus, R. Duke, Ig. Barro Branco. - F. (A-174-3) - stream
<i>Tanytarsus</i> sp. 14	11	W: <i>Tanytarsus</i> sp. 13	RS, Cidade de Mato Leitão, A. do Sampaio. - F., W. - stream
<i>Tanytarsus</i> sp. 15	12	O: ET 133	AM, Manaus, R. Duke, Ig. Gigante. - F. (A-198 4/5) - stream/waterfall
<i>Tanytarsus</i> sp. 16	12	O: ET 104	AM, Manaus, R. Duke, Ig. Acará. - F. (A-192) - stream
"	"	"	AM, Manaus, R. Duke, Ig. Gigante. - F. (A-198 4/5) - stream/waterfall
<i>Tanytarsus</i> sp. 17	13	O: ET 103	AM, Manaus, R. Duke, Ig. Barro Branco. - F. (A-174-3) - stream
<i>Tanytarsus</i> sp. 18	13	O: ET 122	AM, Manaus, R. Duke, Ig. Barro Branco. - F. (A-174-3) - stream
<i>Tanytarsus</i> sp. 19	14	O: ET 124	AM, Manaus, R. Duke, Ig. Acará. - F. (A-192) - stream
<i>Tanytarsus</i> sp. 20	14	W: <i>Tanytarsus</i> sp. 16	RS, S. F. Paula, Pró-Mata. - F., W. - springbrook
<i>Tanytarsus</i> sp. 21	15	O: ET 123	AM, Manaus, R. Duke, Ig. Acará. - F. (A-192) - stream
<i>Tanytarsus</i> sp. 22	15	O: ET 106	AM, Manaus, R. Duke, Ig. Gigante. - F. (A-198 4/5) - stream/waterfall
<i>Tanytarsus</i> sp. 23	16	O: ET 94	AM, Manaus, R. Duke, Ig. Gigante. - F. (A-198 4/5) - stream/waterfall
<i>Tanytarsus</i> sp. 24	16	W: <i>Tanytarsus</i> sp. 12	RS, Taquara, A. do Mineiro. - F., W. - stream
<i>Tanytarsus</i> sp. 25	17	W: <i>Tanytarsus</i> sp. 2	RS, Taquara, A. do Mineiro. - F., W. - stream
<i>Tanytarsus</i> sp. 26	17	O: ET 90	AM, Manaus, R. Duke, Ig. Acará. - F. (A-192) - stream
"	"	"	AM, Manaus, R. Duke, Ig. Gigante. - F. (A-198 4/5) - stream/waterfall
<i>Tanytarsus</i> sp. 27	19	O: ET 89	AM, Manaus, R. Duke, Ig. Gigante. - F. (A-198 4/5) - stream/waterfall

Species name	Fig.	Author: name in the reference	Locality - collector (sample number) - habitat
<i>Tanytarsus</i> sp. 28	19	O: ET 93	AM, Manaus, R. Duke, Ig. Tarumã. - F. (A-190) - stream
"	"	"	AM, Manaus, R. Duke, Ig. Acará. - F. (A-192) - stream
"	"	"	AM, Manaus, R. Duke, Ig. Barro Branco. - F. (A-174-3) - stream
<i>Tanytarsus</i> sp. 29	21	O: ET 119	AM, Manaus, R. Duke, Ig. Acará. - F. (A-192) - stream
<i>Tanytarsus</i> sp. 29	21	O: ET 119	AM, Manaus, R. Duke, Ig. Gigante. - F. (A-198 4/5) - stream/waterfall
<i>Tanytarsus</i> sp. 30	21	O: ET 113	AM, Manaus, R. Duke, Ig. Gigante. - F. (A-198 4/5) - stream/waterfall
"	"	"	AM, Manaus, R. Duke, Ig. Acará. - F. (A-192) - stream
<i>Tanytarsus</i> sp. 31	22	W: <i>Tanytarsus</i> sp. 11	RS, Taquara, A. do Mineiro. - F., W. - stream
<i>Tanytarsus</i> sp. 32	22	O: ET 107	AM, Manaus, R. Duke, Ig. Gigante. - F. (A-198 4/5) - stream/waterfall
<i>Tanytarsus</i> sp. 33	23	O: ET 87	AM, Manaus, R. Duke, Ig. Barro Branco. - F. (A-174-3) - stream
<i>Tanytarsus</i> sp. 34	23	W: <i>Tanytarsus</i> sp. 9	RS, Taquara, A. do Mineiro. - F., W. - stream
<i>Tanytarsus</i> sp. 35	24	W: <i>Tanytarsus</i> sp. 4	RS, S. F. Paula, A. dos Carros. - F., W. - stream
"	"	"	RS, S. F. Paula, Pró-Mata. - F., W. - springbrook
"	"	"	RS, Taquara, A. do Mineiro. - F., W. - stream
<i>Tanytarsus</i> sp. 36	24	O: ET 100	AM, Manaus, R. Duke, Ig. Acará. - F. (A-192) - stream
"	"	"	AM, Manaus, R. Duke, Ig. Carangeju. - F. (A-181-1) - stream
<i>Tanytarsus</i> sp. 37	25	O: ET 102	AM, Manaus, R. Duke, Ig. Gigante. - F. (A-198 4/5) - stream/waterfall
<i>Tanytarsus</i> sp. 38	28	O: ET 91	AM, Manaus, R. Duke, Ig. Barro Branco. - F. (A-174-3) - stream
"	"	"	AM, Manaus, R. Duke, Ig. Carangeju. - F. (A-181-1) - stream
<i>Tanytarsus</i> sp. 39	28	O: ET 92	AM, Manaus, R. Duke, Ig. Acará. - F. (A-192) - stream
<i>Tanytarsus</i> sp. 40	28	O: ET 97	AM, Manaus, R. Duke, Ig. Gigante. - F. (A-198 4/5) - stream/waterfall
<i>Tanytarsus</i> sp. 41	29	W: <i>Tanytarsus</i> sp. 10	RS, S. F. Paula, A. dos Carros. - F., W. - stream
<i>Tanytarsus</i> sp. 42	29	O: ET 99	AM, Manaus, R. Duke, Ig. Gigante. - F. (A-198 4/5) - stream/waterfall
<i>Tanytarsus</i> sp. 43	30	W: <i>Tanytarsus</i> sp. 15	RS, S. F. Paula, Pró-Mata. - F., W. - springbrook
<i>Tanytarsus</i> sp. 44	30	O: ET 131	AM, Manaus, R. Duke, Ig. Acará. - F. (A-192) - stream
"	"	"	AM, Manaus, R. Duke, Ig. Tarumã. - F. (A-190) - stream
<i>Tanytarsus</i> sp. 45	31	O: ET 130	AM, Manaus, R. Duke, Ig. Acará. - F. (A-192) - stream

Species name	Fig.	Author: name in the reference	Locality - collector (sample number) - habitat
<i>Tanytarsus</i> sp. 46	31	O: ET 129	AM, Manaus, R. Duke, Ig. Acará. - F. (A-192) - stream
<i>Tanytarsus</i> sp. 47	32	W: <i>Tanytarsus</i> sp. 3	RS, S. F. Paula, A. dos Carros. - F., W. - stream
<i>Tanytarsus</i> sp. 48	32	O: ET 117	AM, Manaus, R. Duke, Ig. Acará. - F. (A-192) - stream
<i>Tanytarsus</i> sp. 49	33	O: ET 116	AM, Manaus, R. Duke, Ig. Barro Branco. - F. (A-174-3) - stream
<i>Tanytarsus</i> sp. 49	33	O: ET 116	AM, Manaus, R. Duke, Ig. Gigante. - F. (A-198 4/5) - stream/waterfall
<i>Tanytarsus</i> sp. 50	33	W: <i>Tanytarsus</i> sp. 6	RS, S. F. Paula, Pró-Mata. - F., W. - springbrook
"	"	"	RS, S. F. Paula, Pró-Mata. - F., W. - pond
<i>Tanytarsus</i> sp. 51	34	O: ET 105	AM, Manaus, R. Duke, Ig. Acará. - F. (A-192) - stream
<i>Tanytarsus</i> sp. 52	34	O: ET 108	AM, Manaus, R. Duke, Ig. Gigante. - F. (A-198 4/5) - stream/waterfall
"	"	"	AM, Manaus, R. Duke, Ig. Acará. - F. (A-192) - stream
<i>Tanytarsus</i> sp. 53	35	O: ET 114	AM, Manaus, R. Duke, Ig. Acará. - F. (A-192) - stream
<i>Tanytarsus</i> sp. 54	35	O: ET 120	AM, Manaus, R. Duke, Ig. Acará. - F. (A-192) - stream
<i>Tanytarsus</i> sp. 55	36	O: ET 121	AM, Manaus, R. Duke, Ig. Acará. - F. (A-192) - stream
<i>Tanytarsus</i> sp. 56	36	W: <i>Tanytarsus</i> sp. 17	RS, Taquara, A. do Mineiro. - F., W. - stream
"	"	"	RS, S. F. Paula, A. dos Carros. - F., W. - stream
<i>Tanytarsus</i> sp. 57	37	O: ET 115	AM, Manaus, R. Duke, Ig. Barro Branco. - F. (A-174-3) - stream
<i>Tanytarsus</i> sp. 58	37	O: ET 125	AM, Manaus, R. Duke, Ig. Acará. - F. (A-192) - stream
<i>Tanytarsus</i> sp. 59	38	O: ET 111	AM, Manaus, R. Duke, Ig. Gigante. - F. (A-198 4/5) - stream/waterfall
"	"	"	AM, Manaus, R. Duke, Ig. Acará. - F. (A-192) - stream
<i>Tanytarsus</i> sp. 60	38	O: ET 110	AM, Manaus, R. Duke, Ig. Gigante. - F. (A-198 4/5) - stream/waterfall
<i>Tanytarsus</i> sp. 61	39	W: <i>Tanytarsus</i> sp. 5	RS, S. F. Paula, A. dos Carros. - F., W. - stream
<i>Tanytarsus</i> sp. 62	39	O: ET 112	AM, Manaus, R. Duke, Ig. Acará. - F. (A-192) - stream

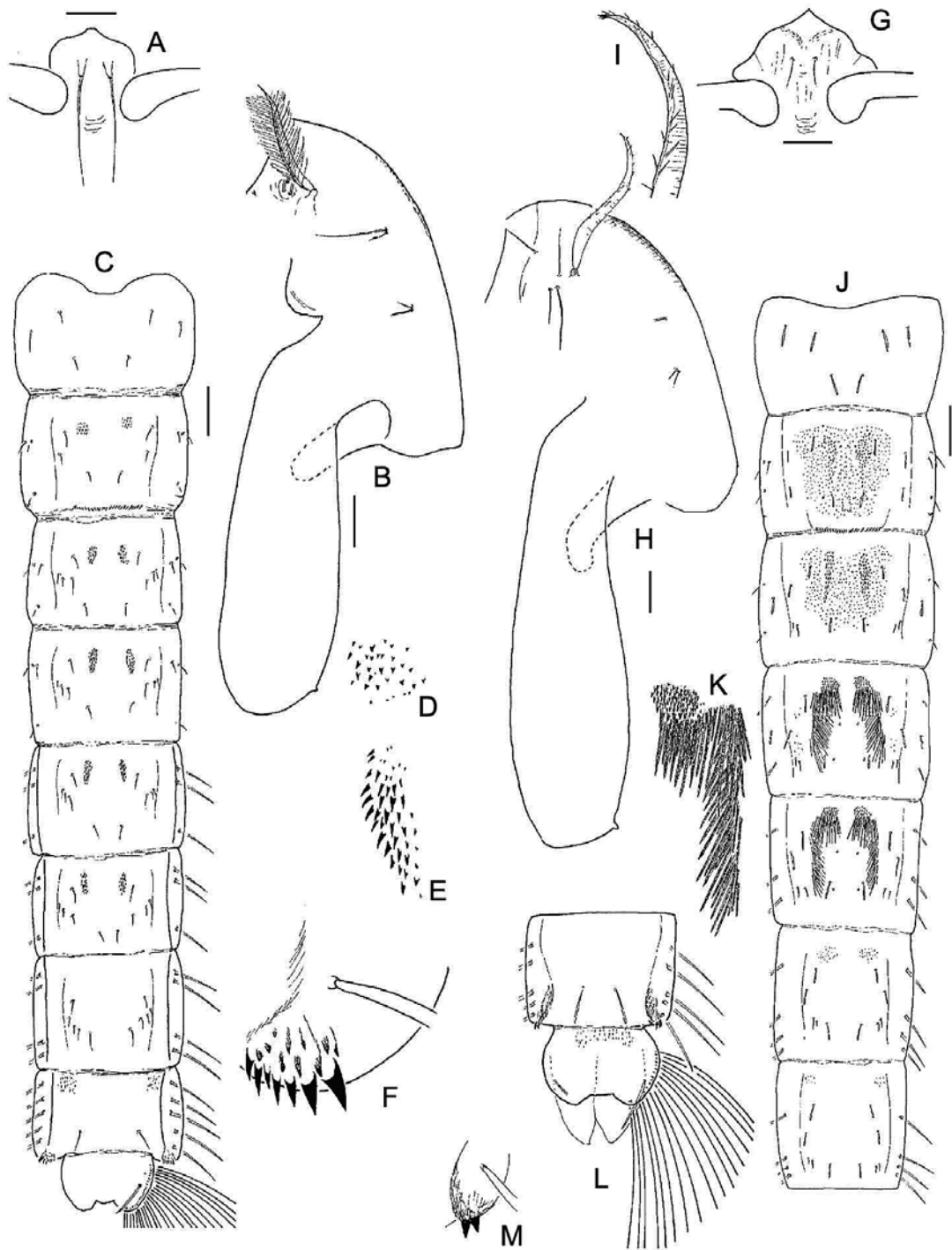


Fig. 1:

?Cladotanytarsus sp. 1 (A-F) and *?Paratanytarsus* sp. 1 (G-M).

A & G: Frontal apotome. B & H: Thorax. I: Thoracic horn (detail). C: Abdomen. J: TI-VII. L: TVIII-IX.

D-E: Armature on TII and TV. K: Armature on TIV. F & M: Comb of segment VIII.

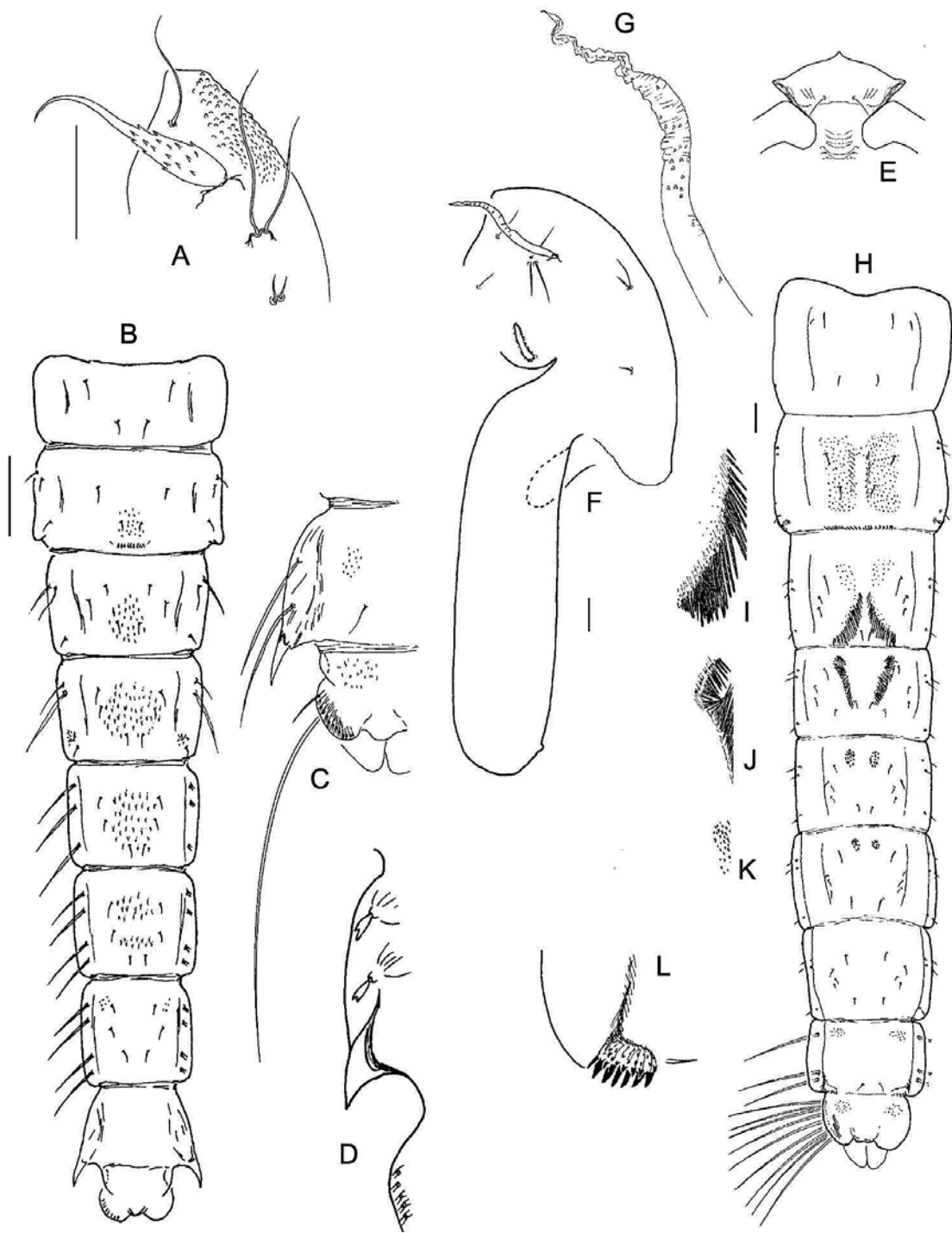


Fig. 2:
Stempellina sp. 1 (A-D) and *Tanytarsus* sp. 1 (E-L).
 E: Frontal apotome. F: Thorax. A: Thorax (detail). G: Thoracic horn (detail). B & H: Abdomen. I-K:
 Armature on TIII-V. C: TVIII-IX. D & L: Spur and comb of segment VIII.

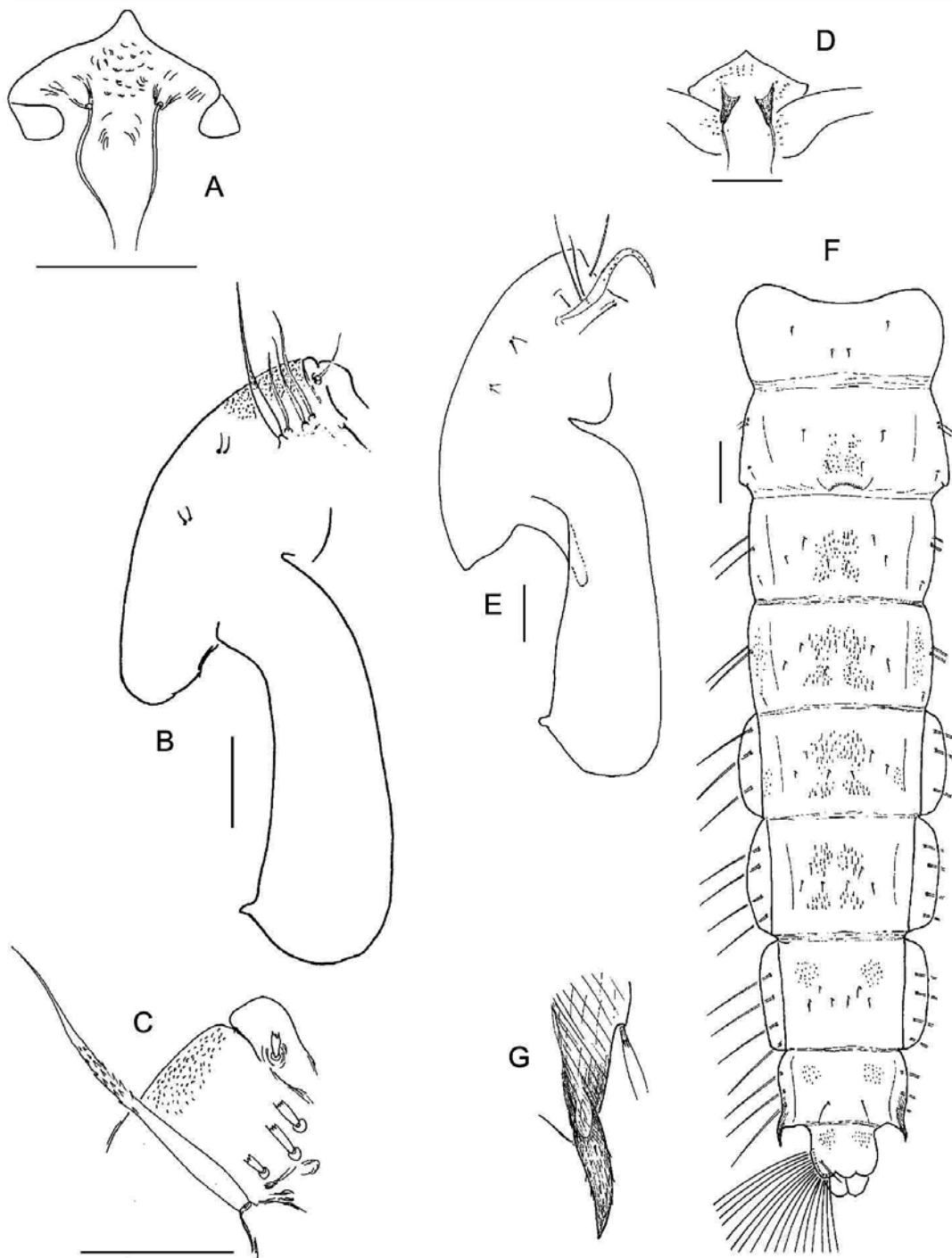


Fig. 3:
Stempellinella sp. 1 (A-C) and *Stempellinella* sp. 2 (D-G).
 A & D: Frontal apotome. B & E: Thorax. C: Thorax (detail). F: Abdomen. G: Spur of segment VIII.

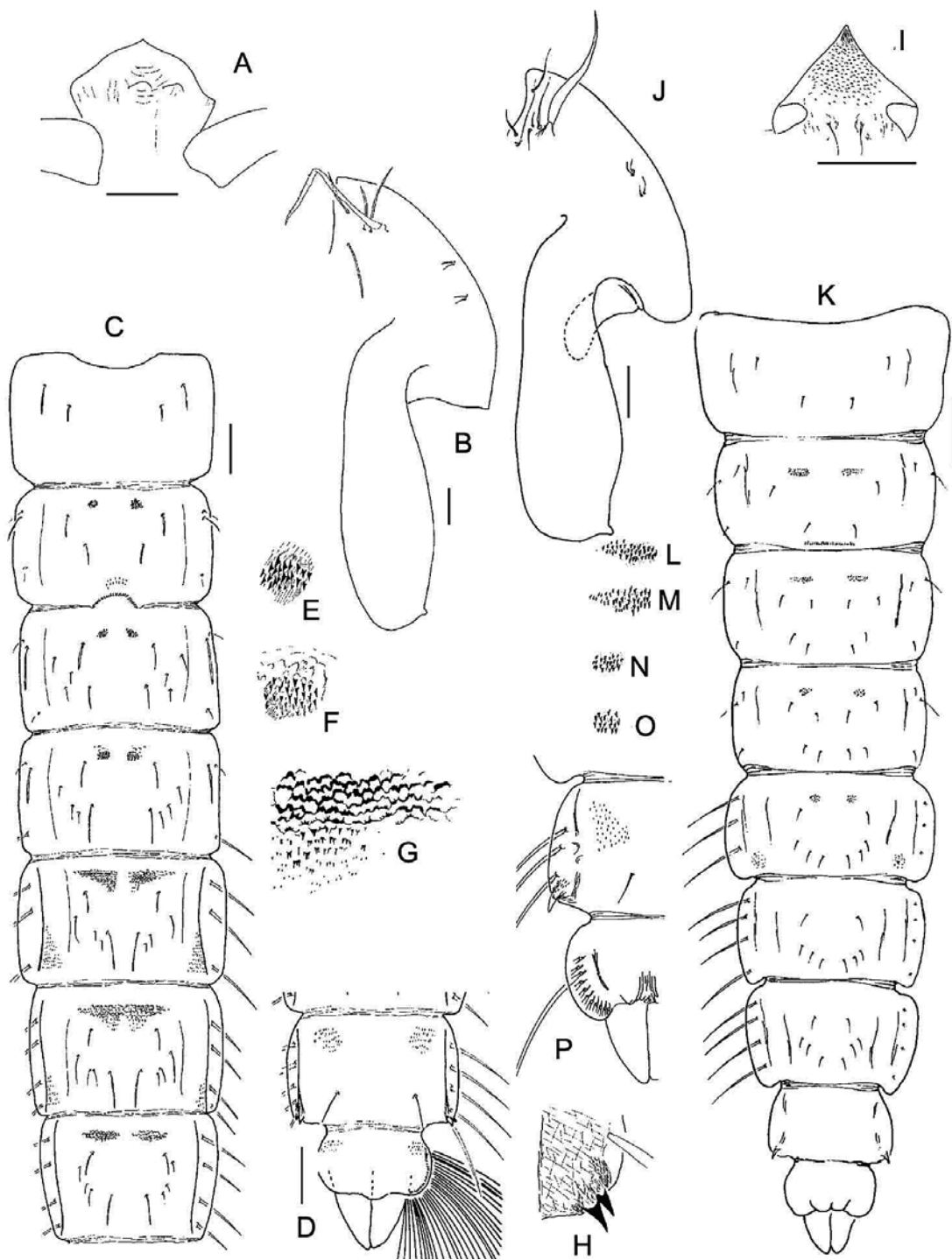


Fig. 4:

Rheotanytarsus sp. 1 (A-H) and *Rheotanytarsus* sp. 2 (I-P).

A & I: Frontal apotome. B & J: Thorax. K: Abdomen. C: TI-VII. D & P: TVIII-IX. E-G: Armature on TII-III and TVI. L-O: Armature on TII-V. H: Comb of segment VIII.

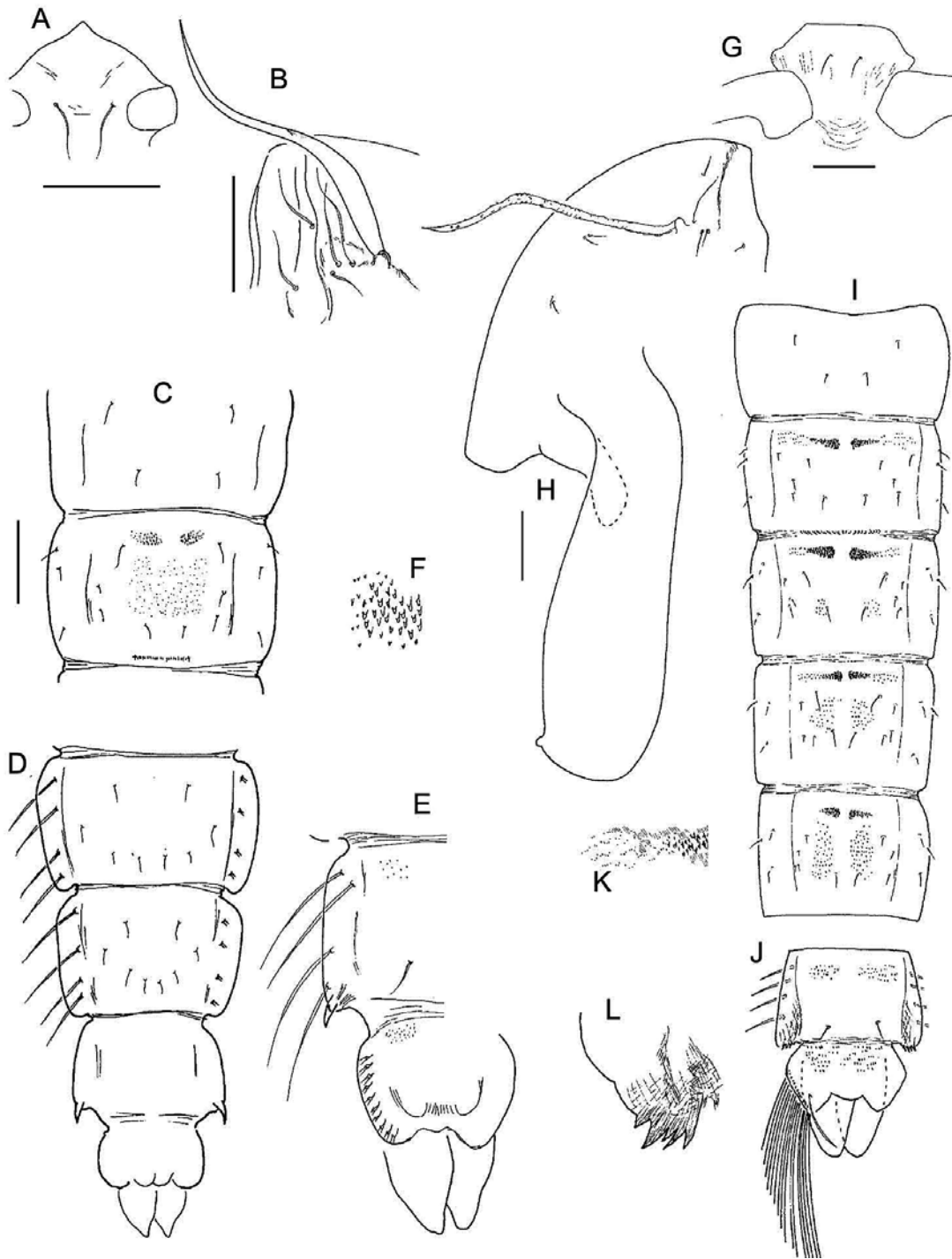


Fig. 5:

Rheotanytarsus sp. 3 (A-F) and ?*Rheotanytarsus* sp. 4 (G-L).

A & G: Frontal apotome. H: Thorax. B: Thorax (detail). C: TI-II. I: TI-V. D: TVI-IX. E & J: TVIII-IX.

F: Armature on TIII. K: Armature on TIII. L: Comb of segment VIII.

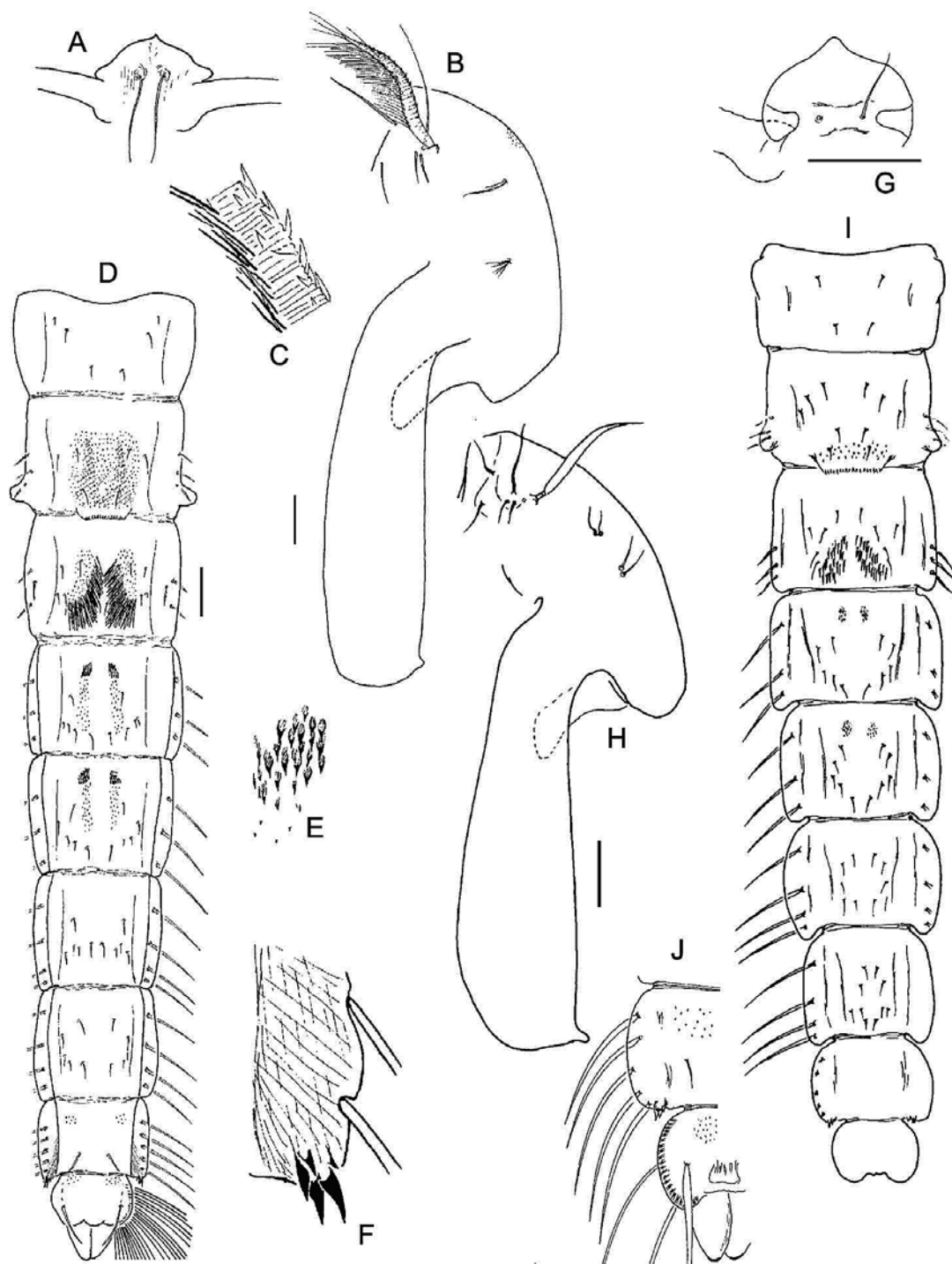


Fig. 6:

Tanytarsus sp. 2 (A-F) and *Tanytarsus* sp. 3 (G-J).

A & G: Frontal apotome. B & H: Thorax. C: Thoracic horn (detail). D & I: Abdomen. E: Point patches on TIV. J: TVIII-IX. F: Comb of segment VIII.

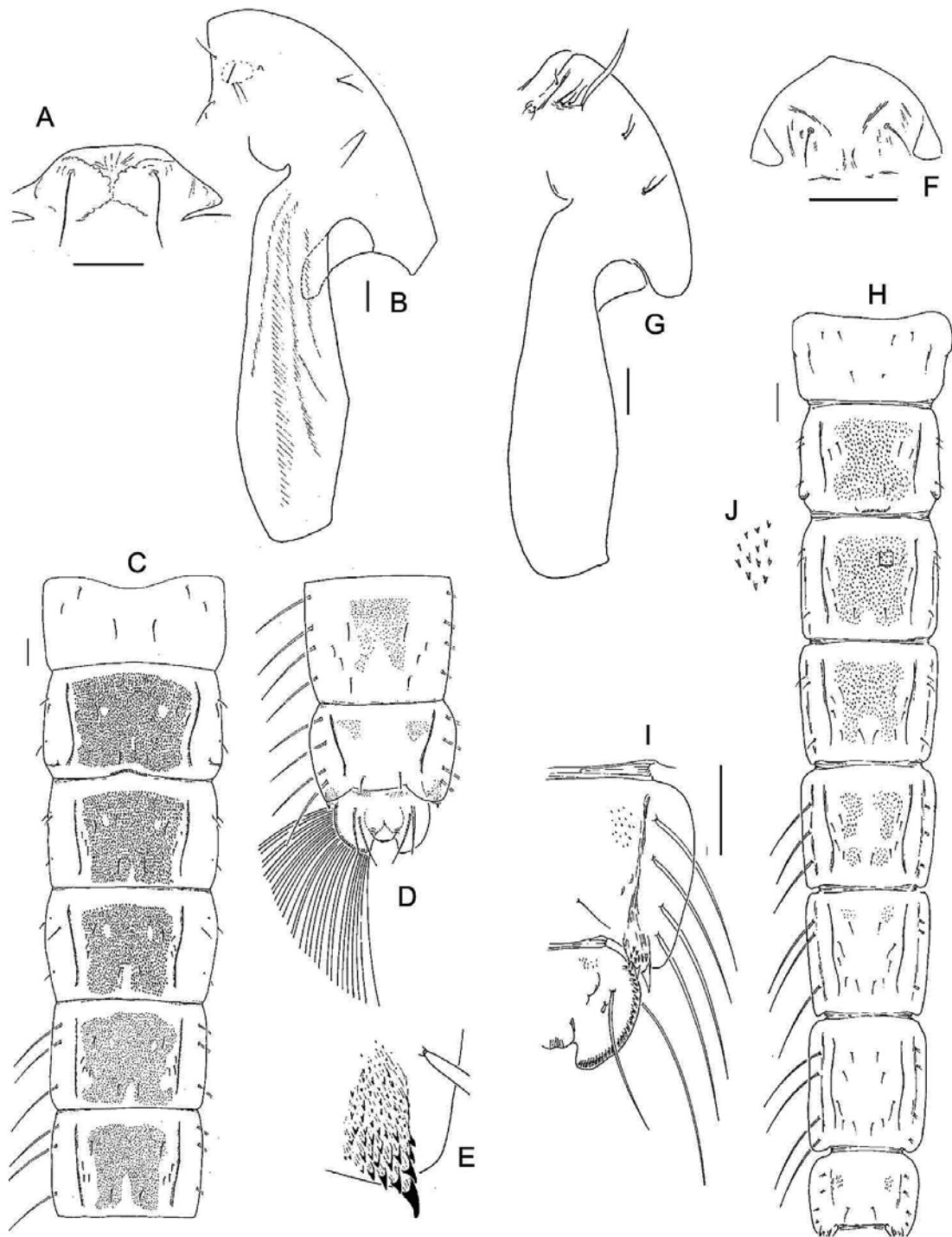


Fig. 7:

Tanytarsus sp. 4 (A-E) and *Tanytarsus* sp. 5 (F-J).

A & F: Frontal apotome. B: Thorax (thoracic horn probably lost). G: Thorax. C: T1-VI. H: T1-VIII. D: TVII-IX. I: TVIII-IX. J: Armature on TIII. E: Comb of segment VIII.

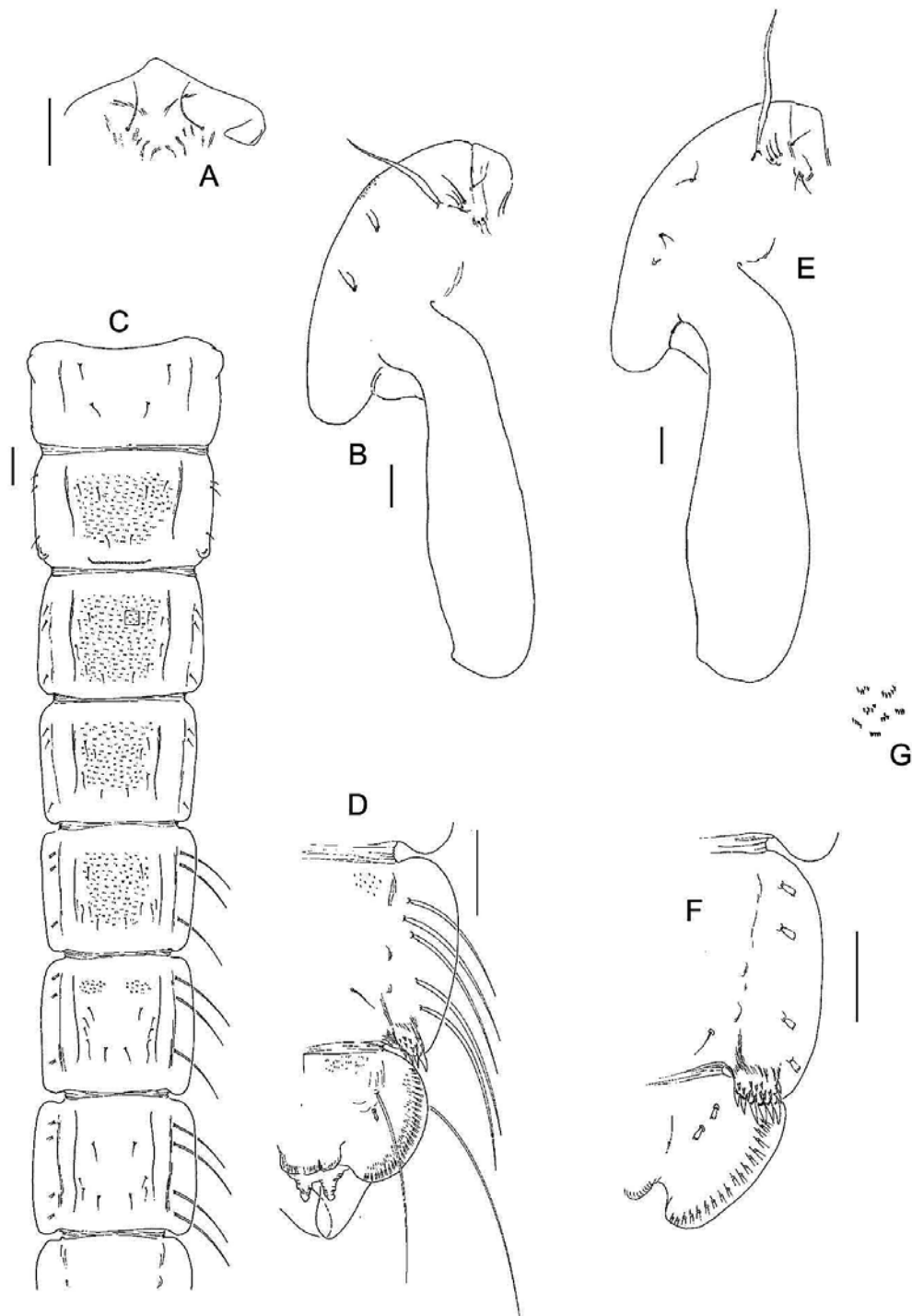


Fig. 8:

Tanytarsus sp. 6 (A-D) and *Tanytarsus* sp. 7 (E-G).

A: Frontal apotome. B & E: Thorax. C: TI-VII. D & F: TVIII-IX. G: Armature on TIII.

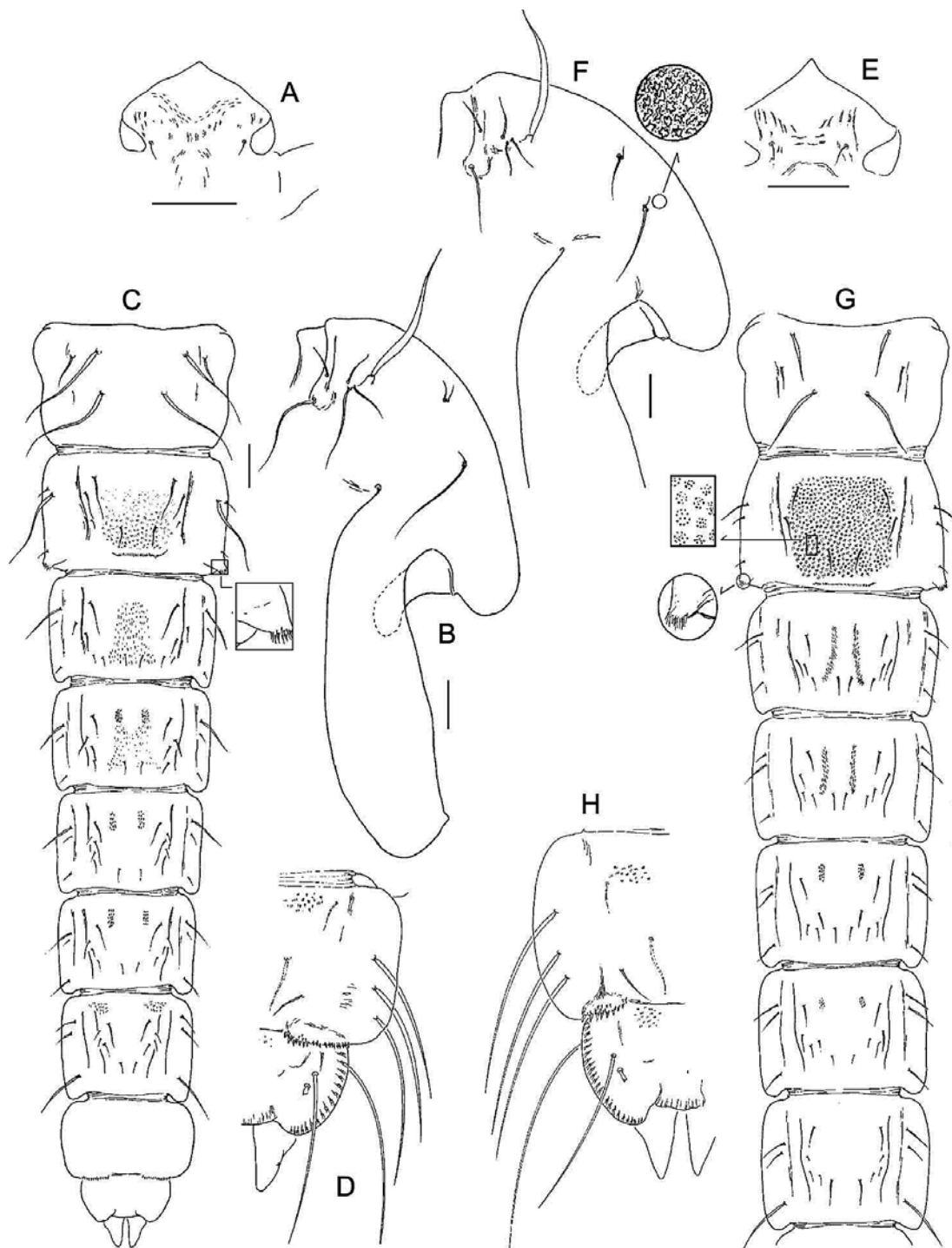


Fig. 9:

Tanytarsus sp. 8 (A-D) and *Tanytarsus* sp. 9 (E-H).

A & E: Frontal apotome. B & F: Thorax. C: Abdomen. G: TI-VII. D & H: TVIII-IX.

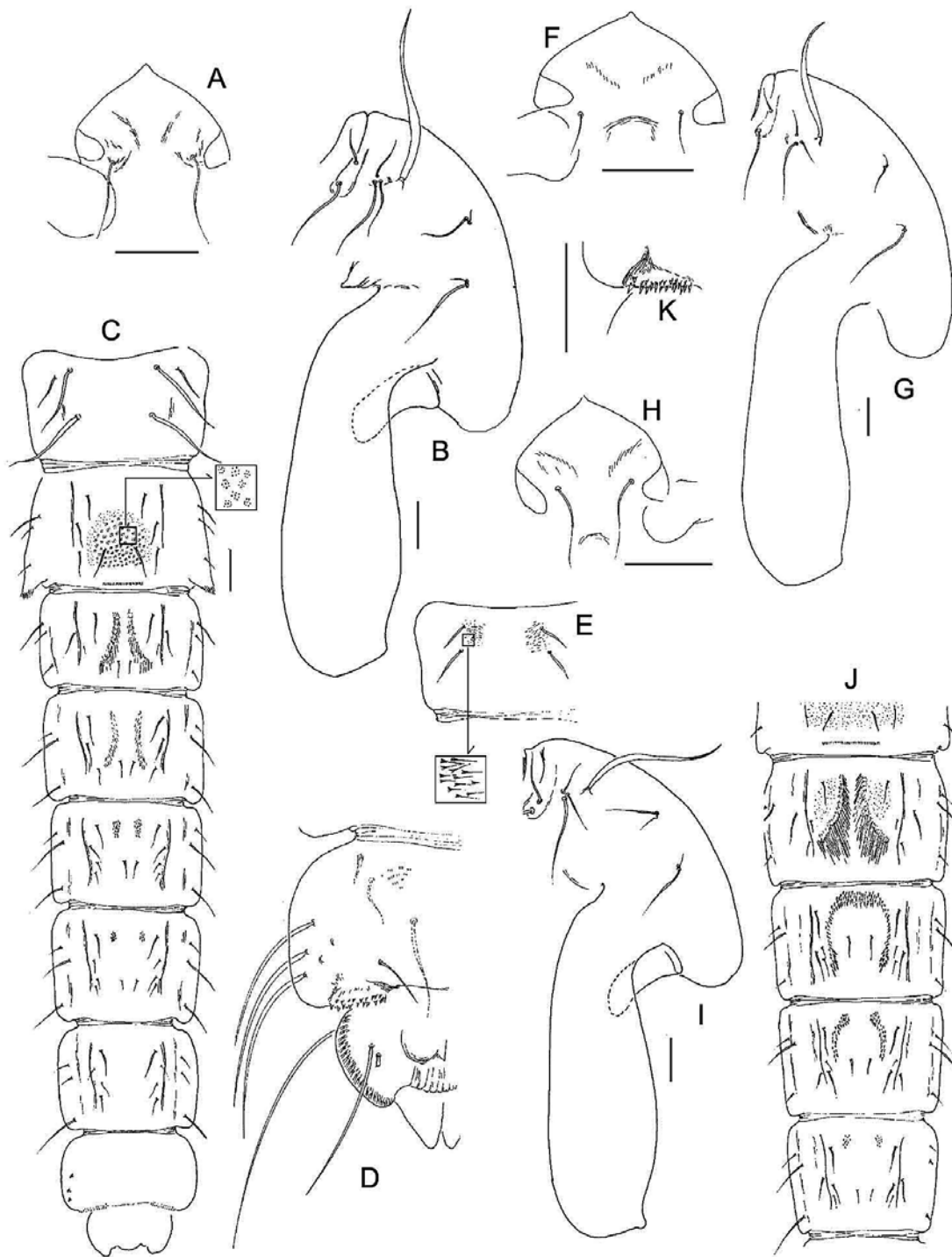


Fig. 10:

Tanytarsus sp. 10 (A-E), *Tanytarsus* sp. 11 (F-G) and *Tanytarsus* sp. 12 (H-K).

A, F, H: Frontal apotome. B, G & I: Thorax. C: Abdomen. J: TII-VI. D: TVIII-IX. E: Sternite I. K: Comb of segment VIII.

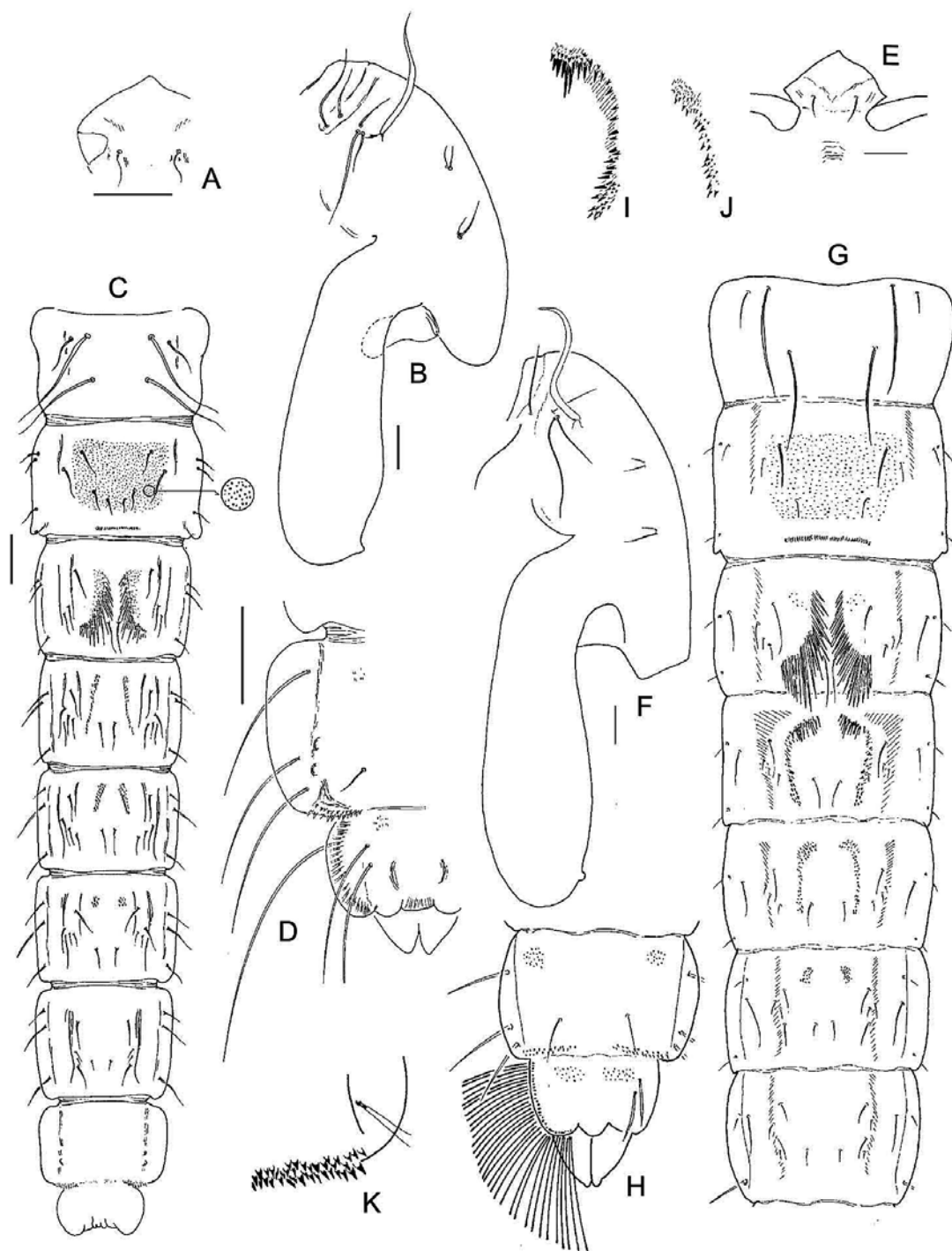


Fig. 11:

Tanytarsus sp. 13 (A-D) and *Tanytarsus* sp. 14 (E-K).

A & E: Frontal apotome. B & F: Thorax. C: Abdomen. G: T1-VII. D & H: TVIII-IX. I-J: Spines on TIV-V. K: Comb of segment VIII.

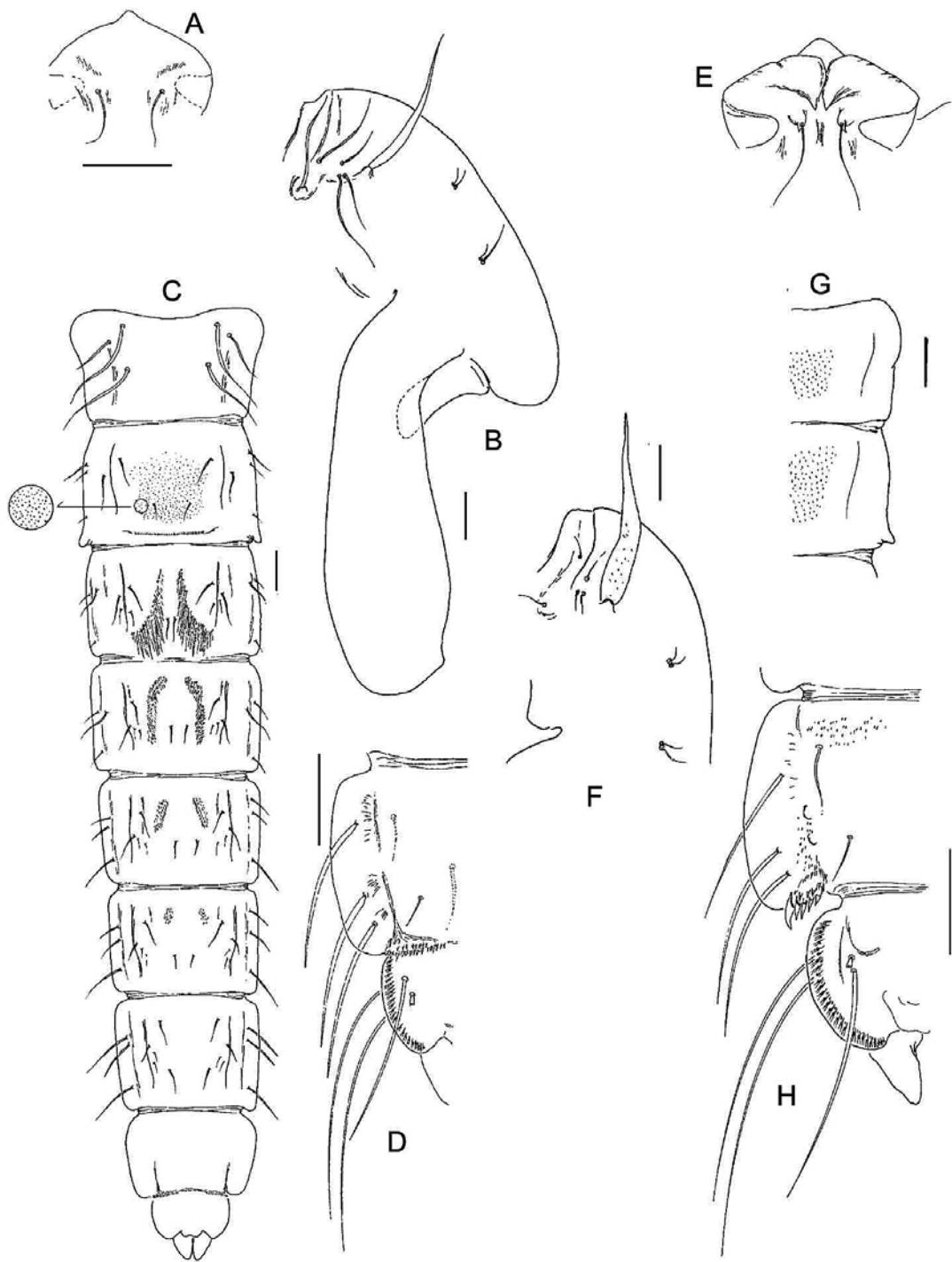


Fig. 12:

Tanytarsus sp. 15 (A-D) and *Tanytarsus* sp. 16 (E-H).

A & E: Frontal apotome. B: Thorax. F: Thorax (detail). C: Abdomen. G: Sternites I-II (setae omitted). H & D: TVIII-IX.

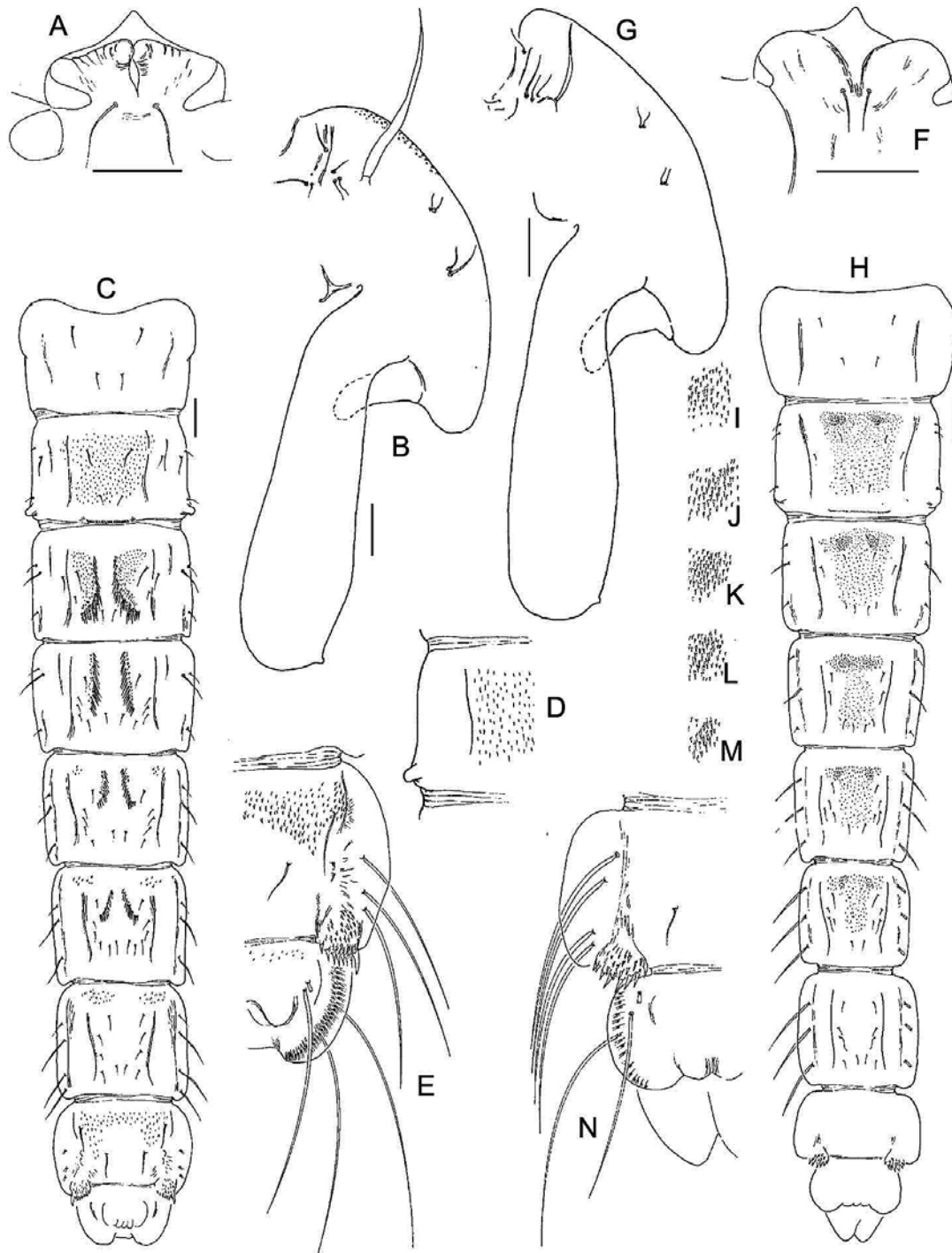


Fig. 13:

Tanytarsus sp. 17 (A-E) and *Tanytarsus* sp. 18 (F-N).

A & F: Frontal apotome. B & G: Thorax. C & H: Abdomen. D: Sternite II (setae omitted). E & N: TVIII-IX. I-M: Point patches on TIII-VI.

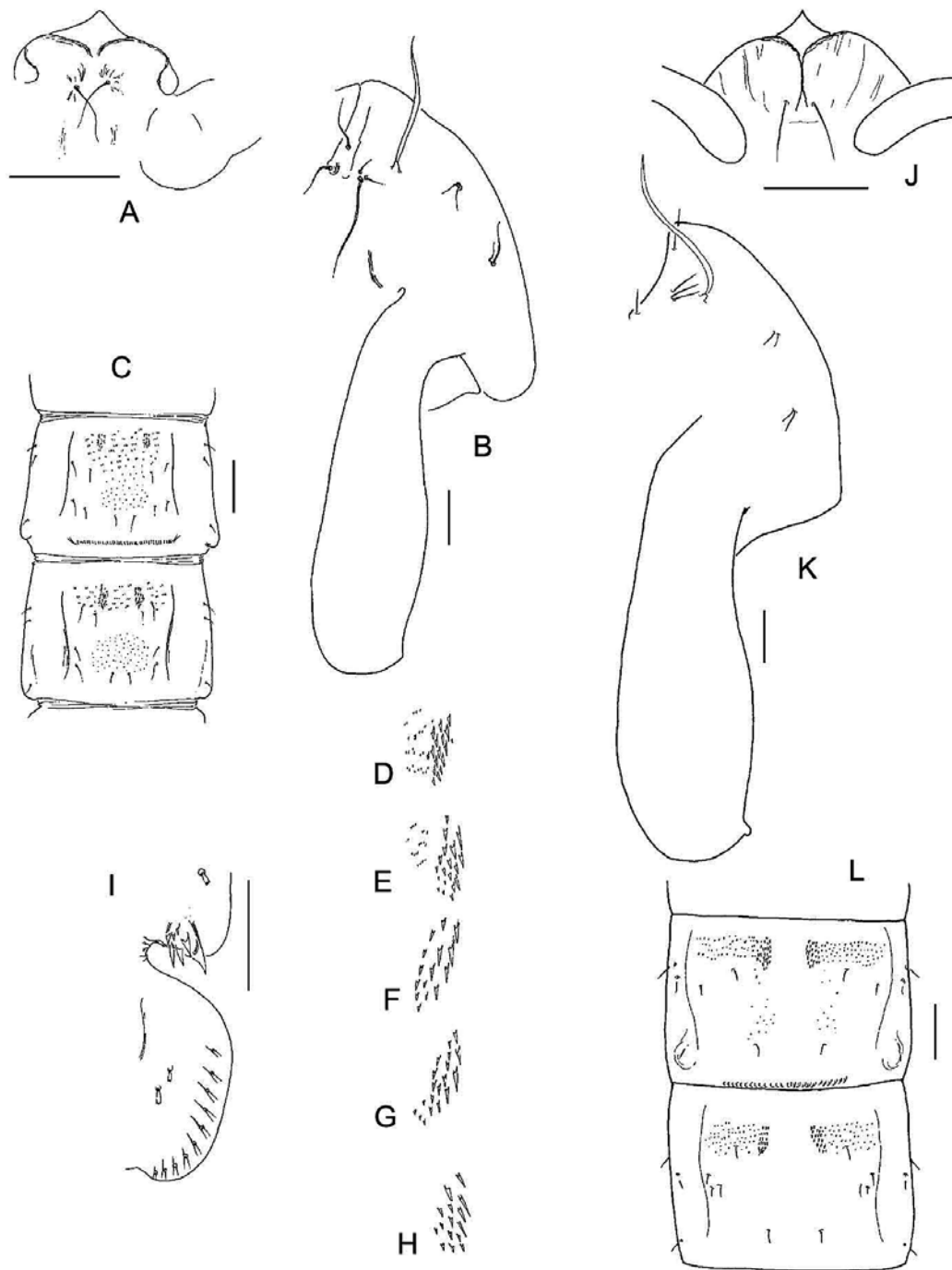


Fig. 14:

Tanytarsus sp. 19 (A-I) and *Tanytarsus* sp. 20 (J-L).

A & J: Frontal apotome. B & K: Thorax. C & L: TII-III. D-H: Point patches on TII-VI. I: Comb of segment VIII and anal lobe.

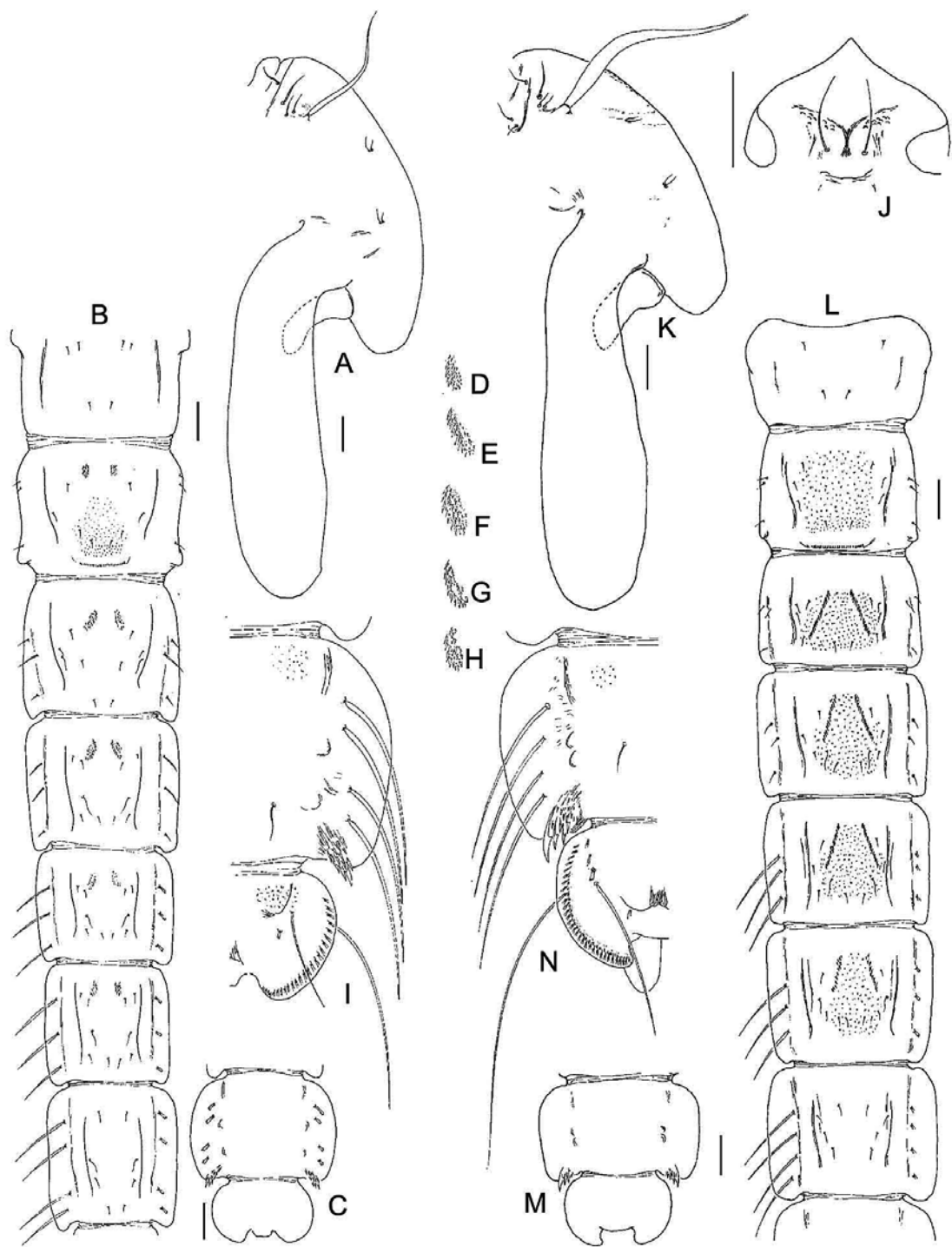


Fig. 15:

Tanytarsus sp. 21 (A-I) and *Tanytarsus* sp. 22 (J-N).

J: Frontal apotome. A & K: Thorax. B & L: TI-TVII. C, I, M & N: TVIII-IX. D-H: Point patches on TII-VI.

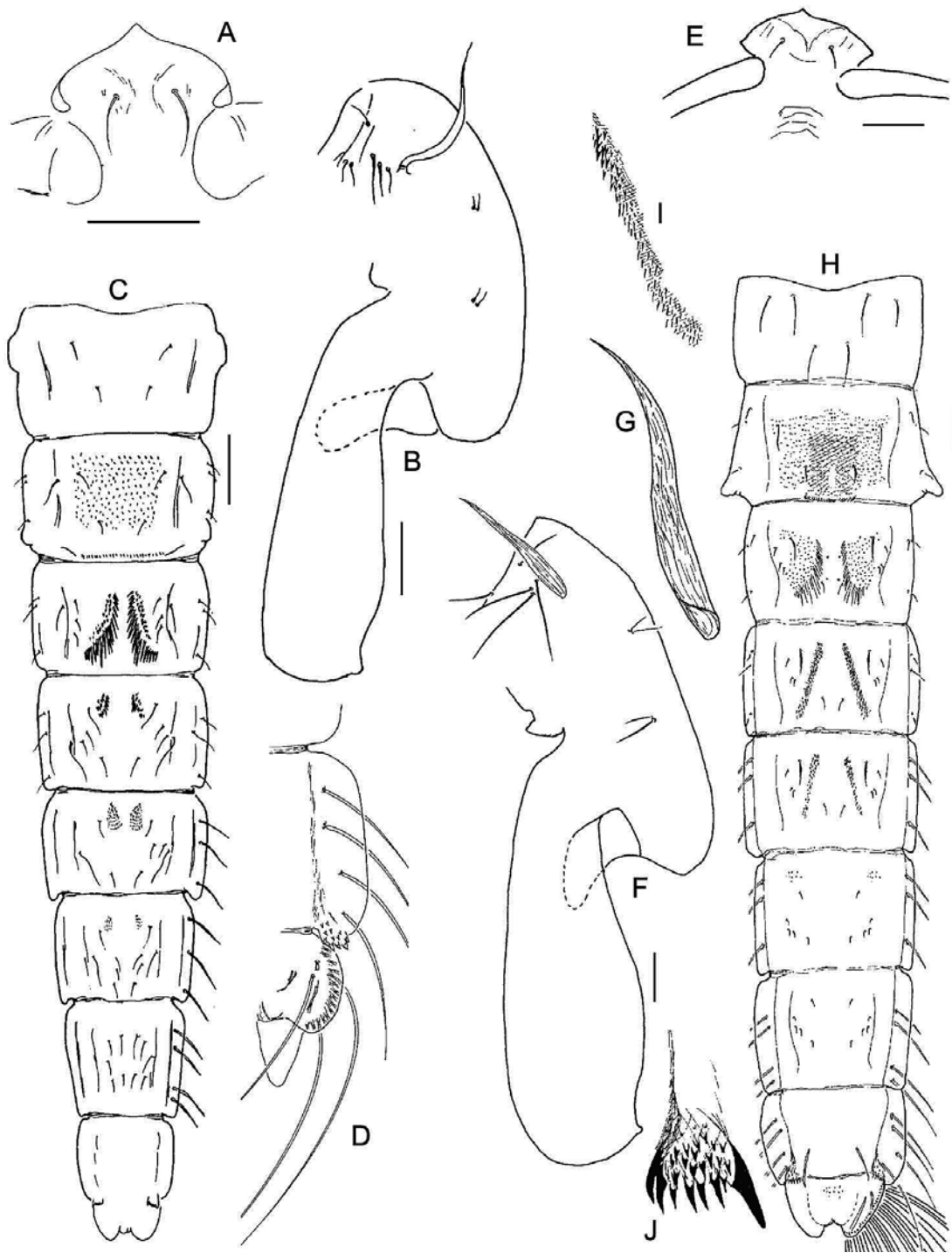


Fig. 16:

Tanytarsus sp. 23 (A-D) and *Tanytarsus* sp. 24 (E-J).

A & E: Frontal apotome. B & F: Thorax. G: Thoracic horn. C & H: Abdomen. D: TVIII-IX. I: Spines on TIV. J: Comb of segment VIII.

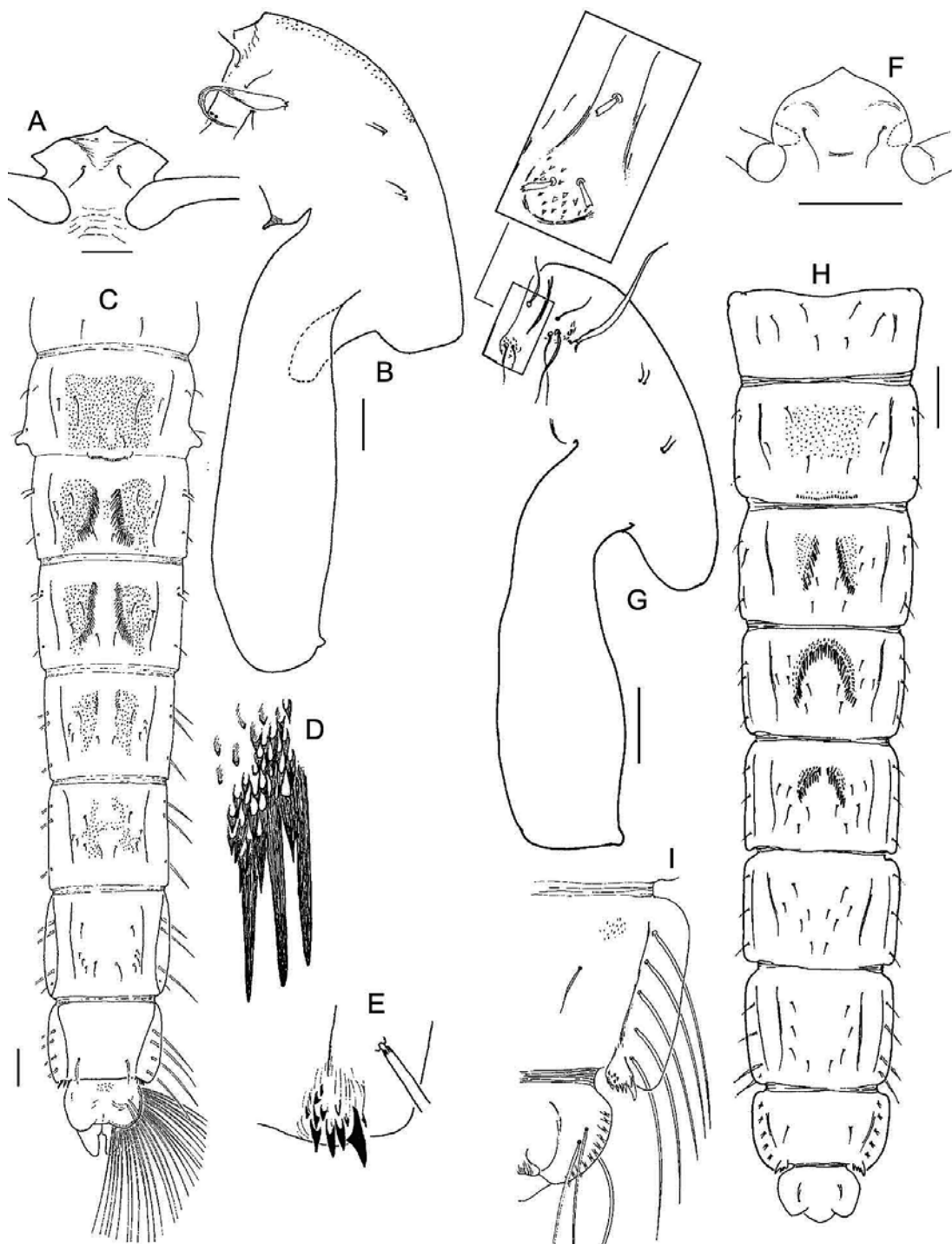


Fig. 17:

Tanytarsus sp. 25 (A-E) and *Tanytarsus* sp. 26 (F-I).

A & F: Frontal apotome. B & G: Thorax. C & H: Abdomen. I: TVIII-IX. D: Spines on TIII. E: Comb of segment VIII.

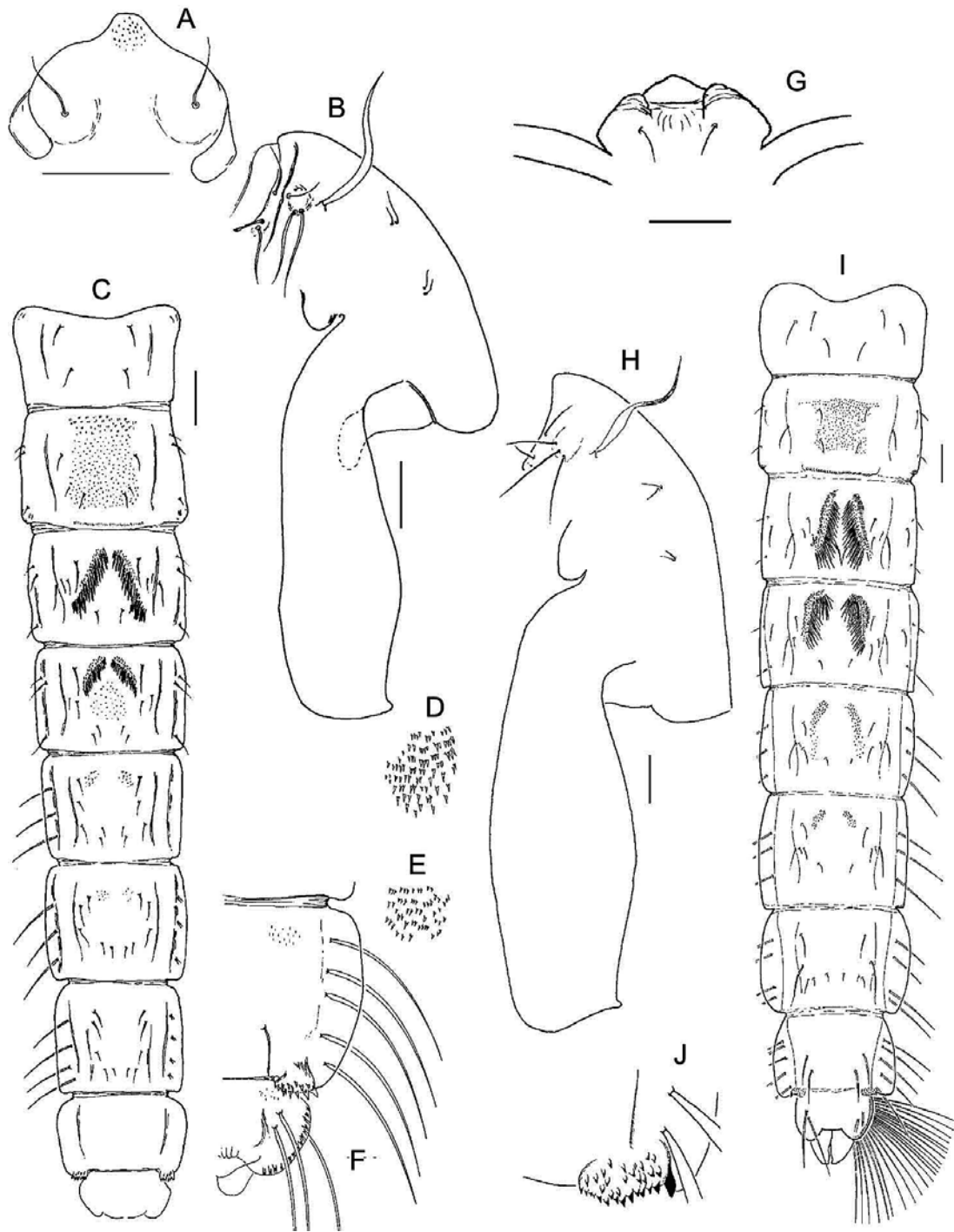


Fig. 18:

?Caladomyia sp. 1 (A-F) and *?Caladomyia* sp. 2 (G-J).

A & G: Frontal apotome. B & H: Thorax. C & I: Abdomen. D & E: Armature on TV and TVI. F: TVIII-IX. J: Comb of segment VIII.

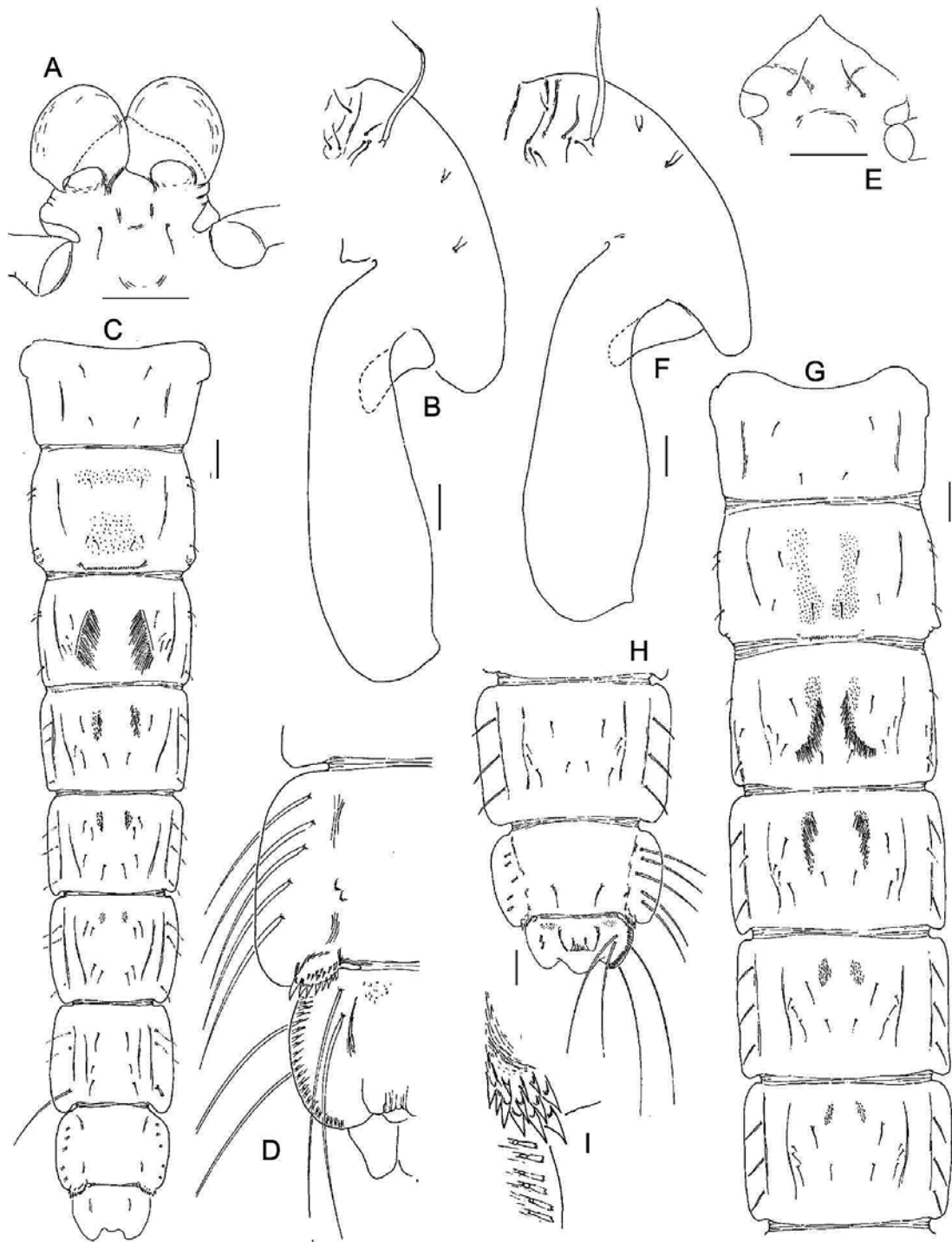


Fig. 19:
Tanytarsus sp. 28 (A-D) and *Tanytarsus* sp. 27 (E-I).
 A & E: Frontal apotome. B & F: Thorax. C: Abdomen. G: T1-VI. D: TVIII-IX. H: TVII-IX. I: Comb of segment VIII.

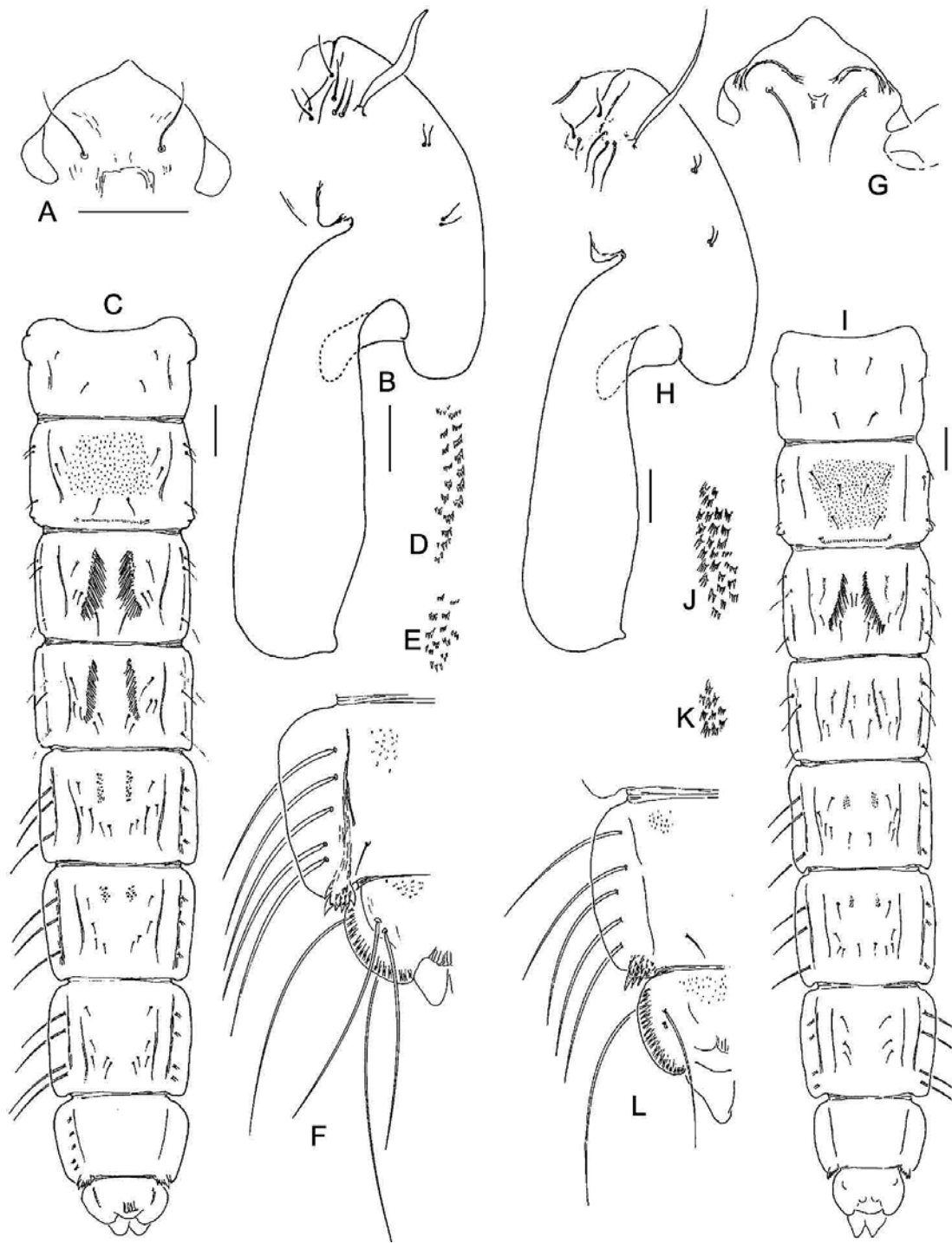


Fig. 20:

?*Caladomyia* sp. 4 (A-F) and ?*Caladomyia* sp. 3 (G-L).

A & G: Frontal apotome. B & H: Thorax. C & I: Abdomen. D-E & J-K: Armature on TV and TVI. F & L: TVIII-IX.

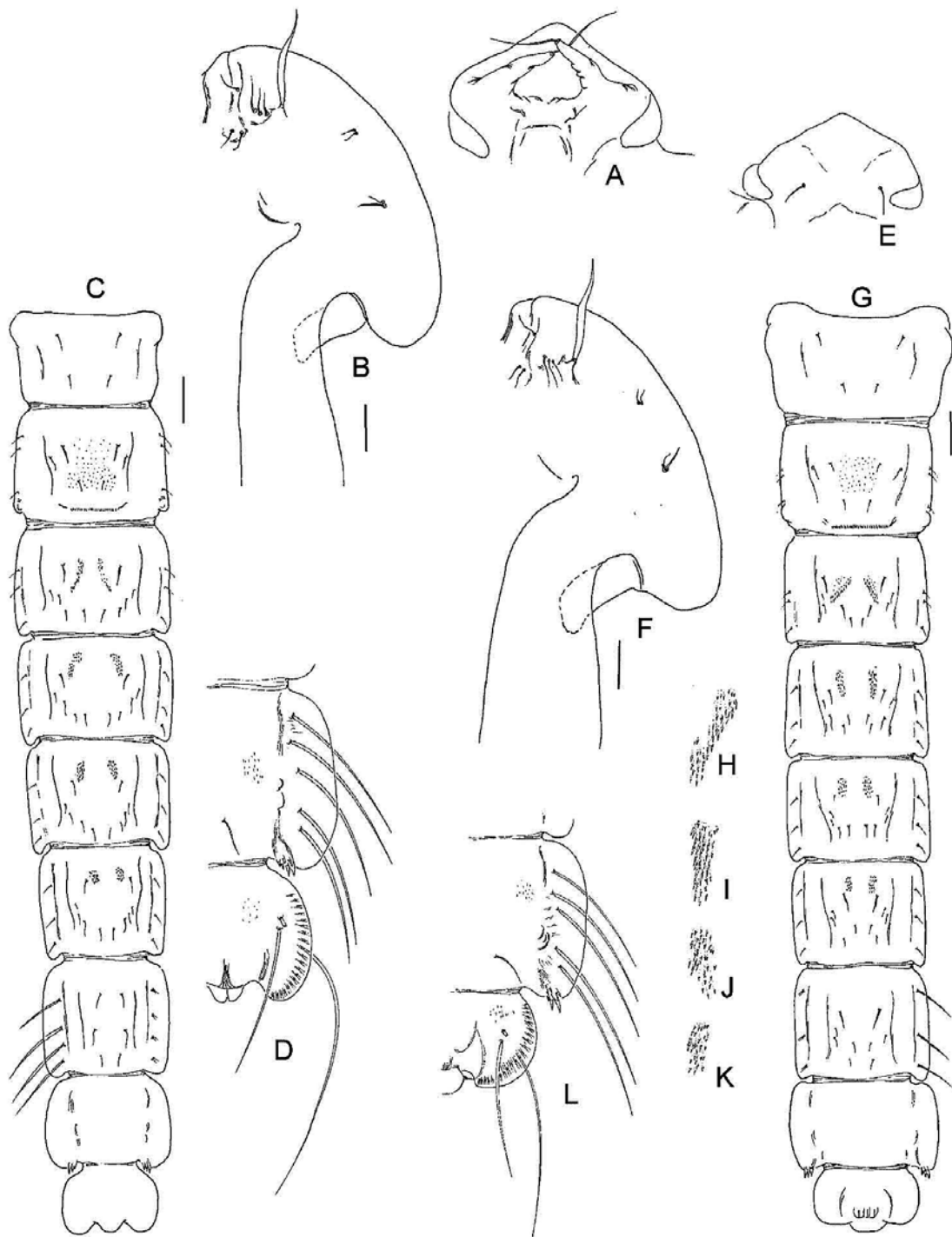


Fig. 21:
Tanytarsus sp. 29 (A-D) and *Tanytarsus* sp. 30 (E-L).
 A & E: Frontal apotome. B & F: Thorax. C & G: Abdomen. D & L: TVIII-IX. H-K: Armature on TIII-VI.



Fig. 22 :

Tanytarsus sp. 31 (A-G) and *Tanytarsus* sp. 32 (H-K).

A & H: Frontal apotome. B & I: Thorax. C: T1-VII. J: T1-TVI. D & K: TVIII-IX. E-F: Armature on TIV-V. G: Comb of segment VIII.

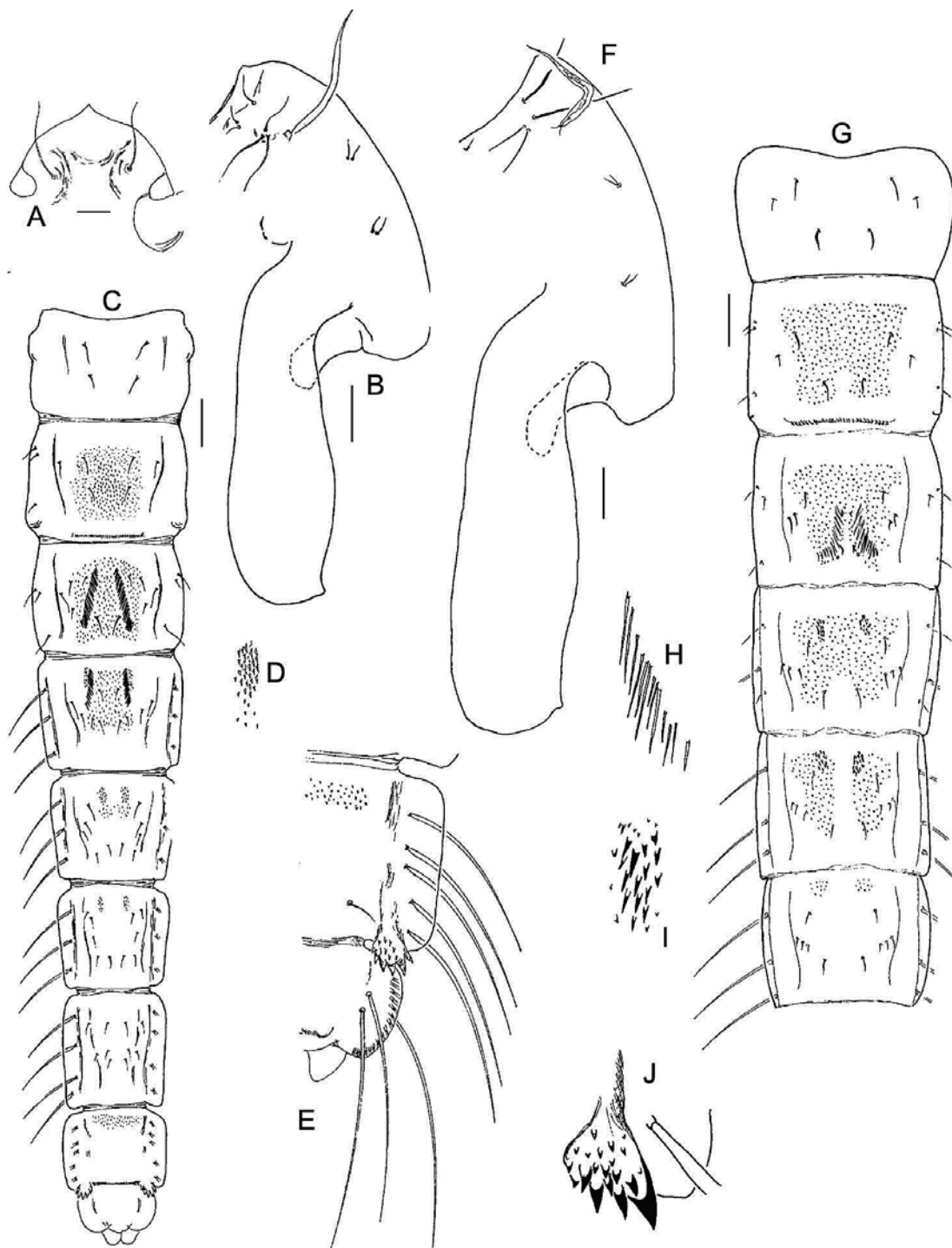


Fig. 23:

Tanytarsus sp. 33 (A-E) and *Tanytarsus* sp. 34 (F-J).

A: Frontal apotome. B & F: Thorax. C: Abdomen. G: T1-VI. E: TVIII-IX. D: Point patches on TV. H-I: Armature on TIII-IV. J: Comb of segment VIII.

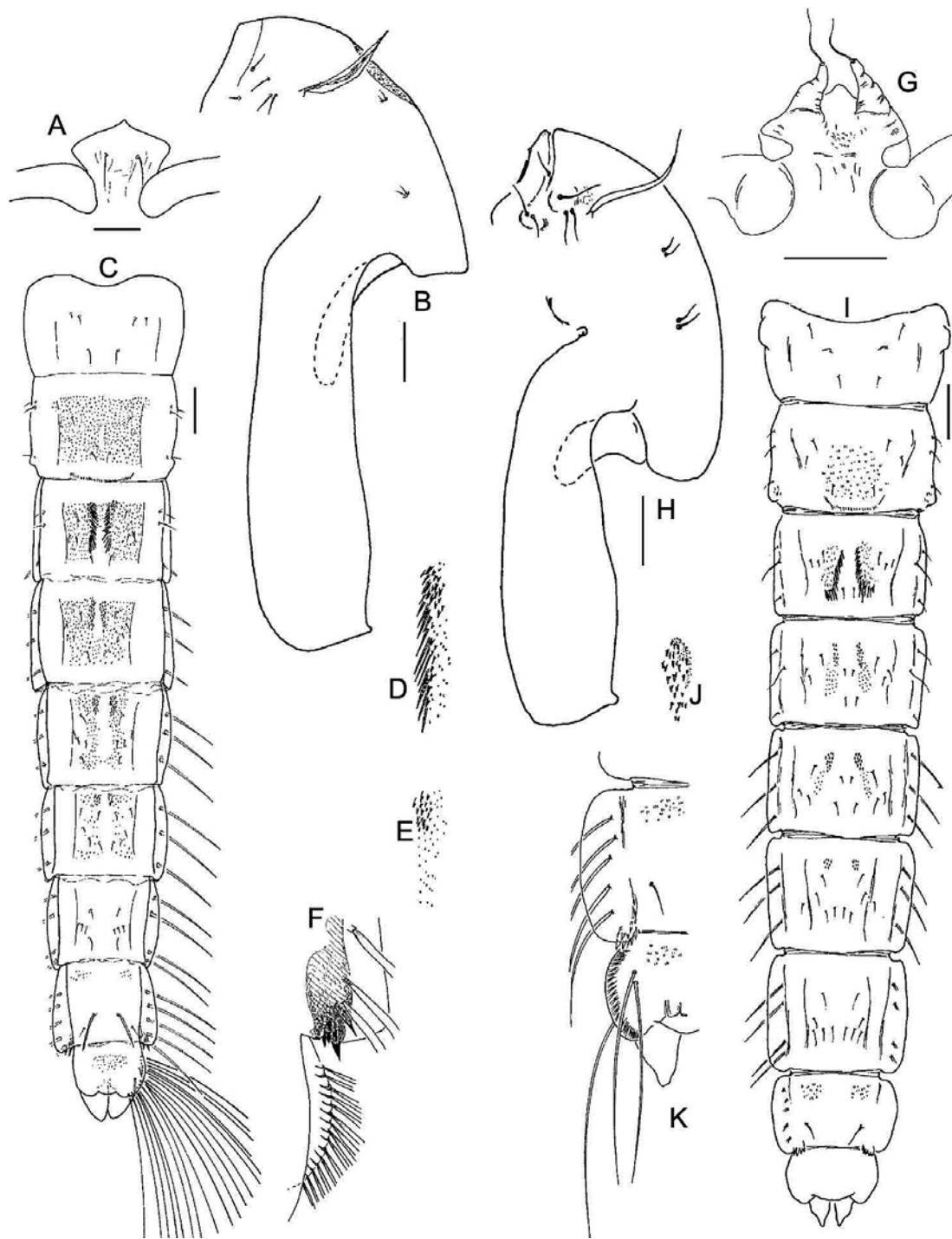


Fig. 24:

Tanytarsus sp. 35 (A-F) and *Tanytarsus* sp. 36 (G-K).

A & G: Frontal apotome. B & H: Thorax. C & I: Abdomen. K: TVIII-IX. D: Armature on TIII. E & J: Armature on TIV. F: Comb of segment VIII.

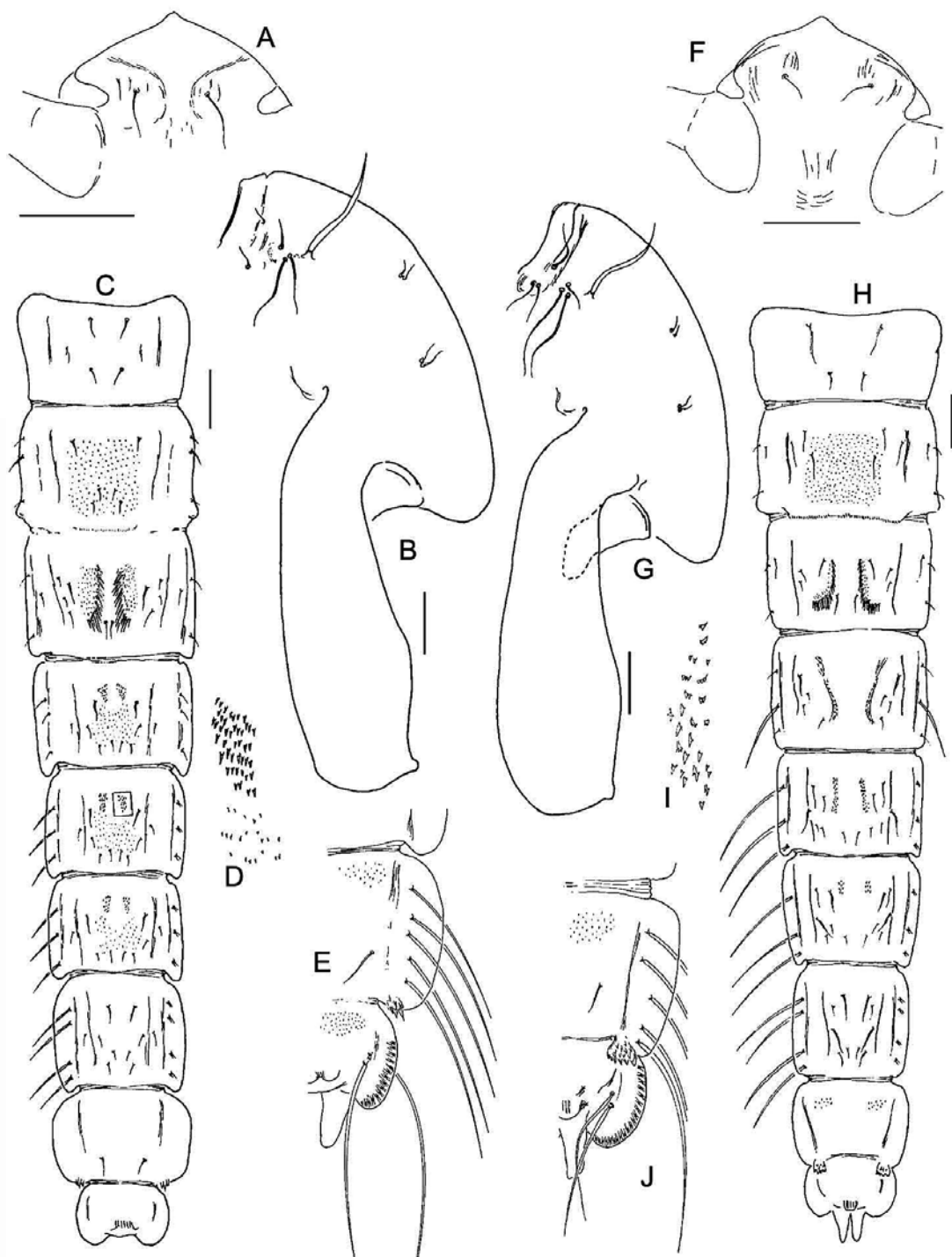


Fig. 25:

Tanytarsus sp. 37 (A-E) and ?*Caladomyia* sp. 5 (F-J).

A & F: Frontal apotome. B & G: Thorax. C & H: Abdomen. D & I: Armature on TV. E & J: TVIII-IX.

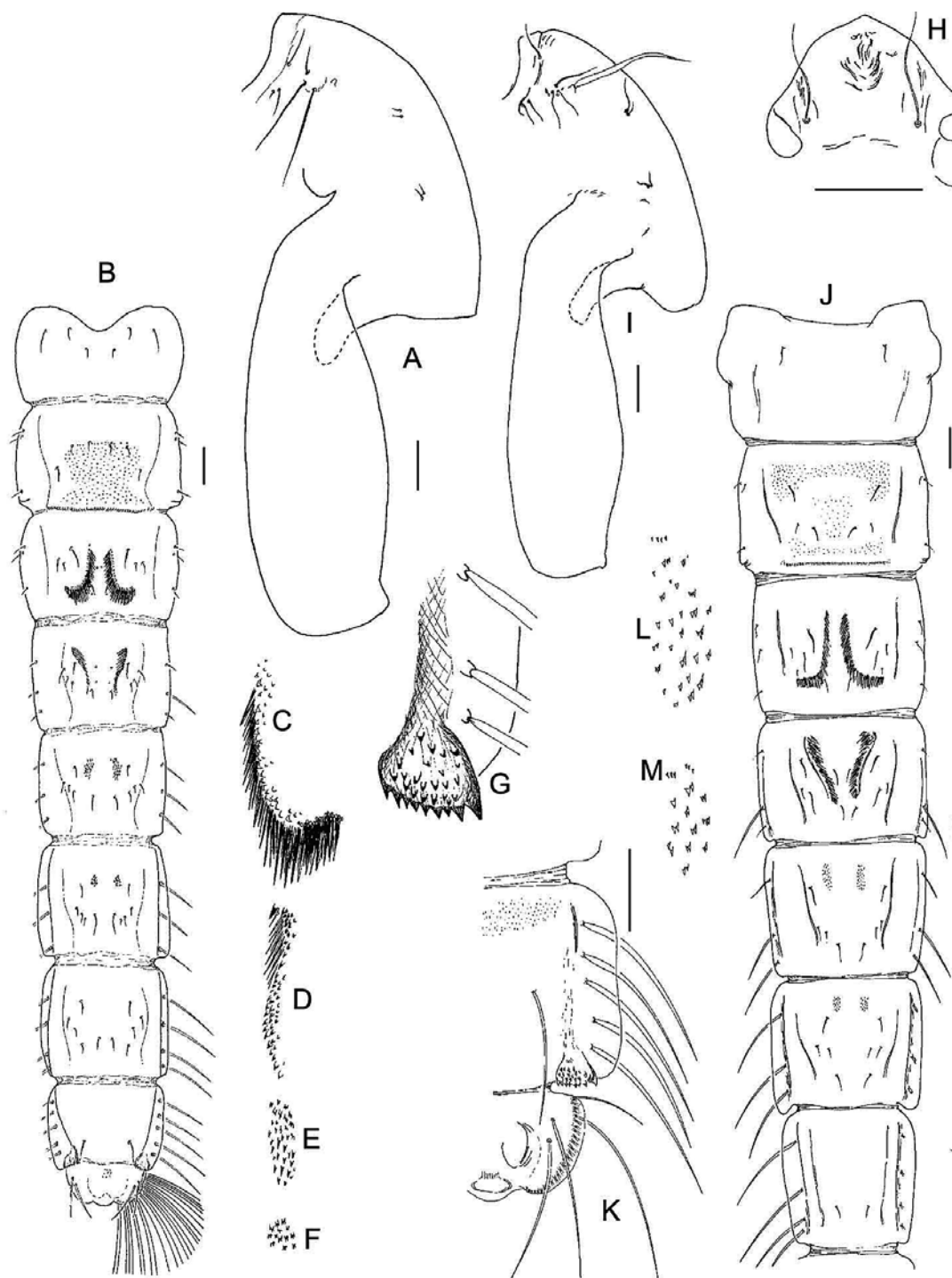


Fig. 26:

?*Caladomyia* sp. 6 (A-G) and ?*Caladomyia* sp. 7 (H-M).

H: Frontal apotome. A & I: Thorax. B: Abdomen. J: T1-VII. K: TVIII-IX. C-F: Armature on TIII-VI.

L-M: Armature on TV-VI. G: Comb of segment VIII.

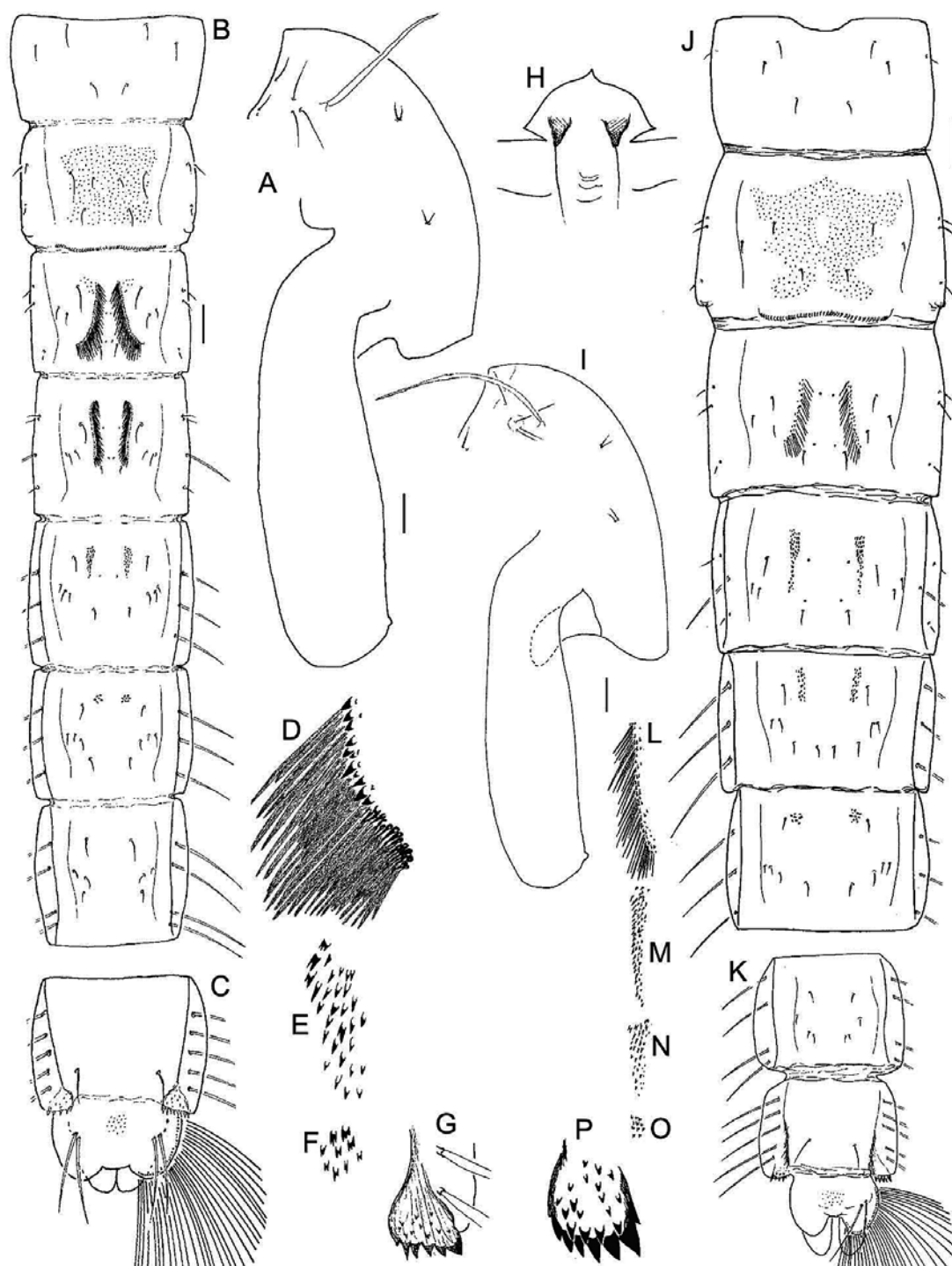


Fig. 27:

?*Caladomyia* sp. 8 (A-G) and ?*Caladomyia* sp. 9 (H-P).

H: Frontal apotome. A & I: Thorax. J: T1-VI. B: T1-VII. C: TVIII-IX. K: TVII-IX. D-F: Armature on TIII (posterior end of band), TV-VI. L-O: Armature on TIII-VI. G & P: Comb of segment VIII.

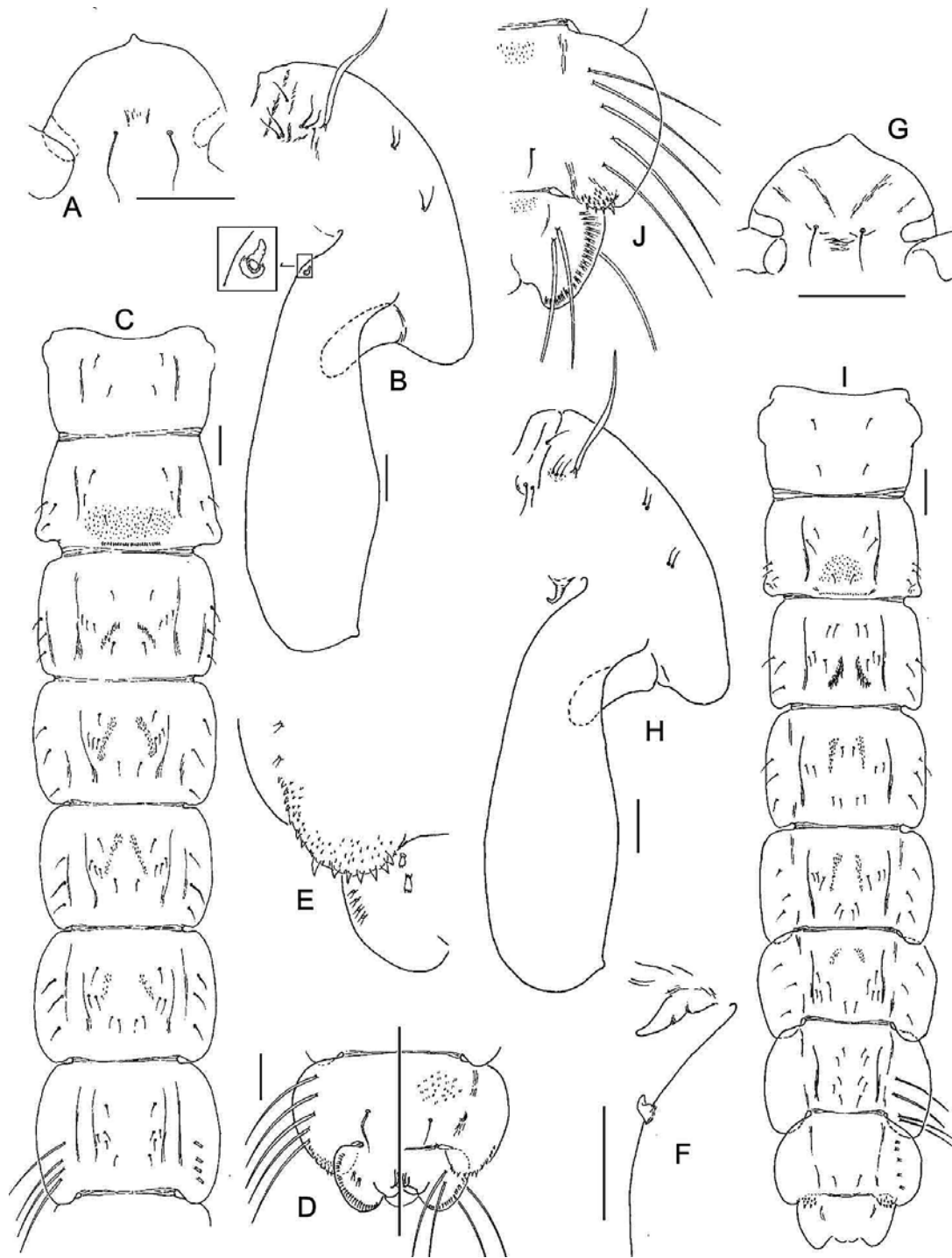


Fig. 28:

Tanytarsus sp. 38 (A-E), *Tanytarsus* sp. 39 (F) and *Tanytarsus* sp. 40 (G-J).

A & G: Frontal apotome. B & H: Thorax. F: Wing sheath and prealar tubercle (detail). I: Abdomen. C: T1-VII. D & J: TVIII-IX. E: Comb of segment VIII.

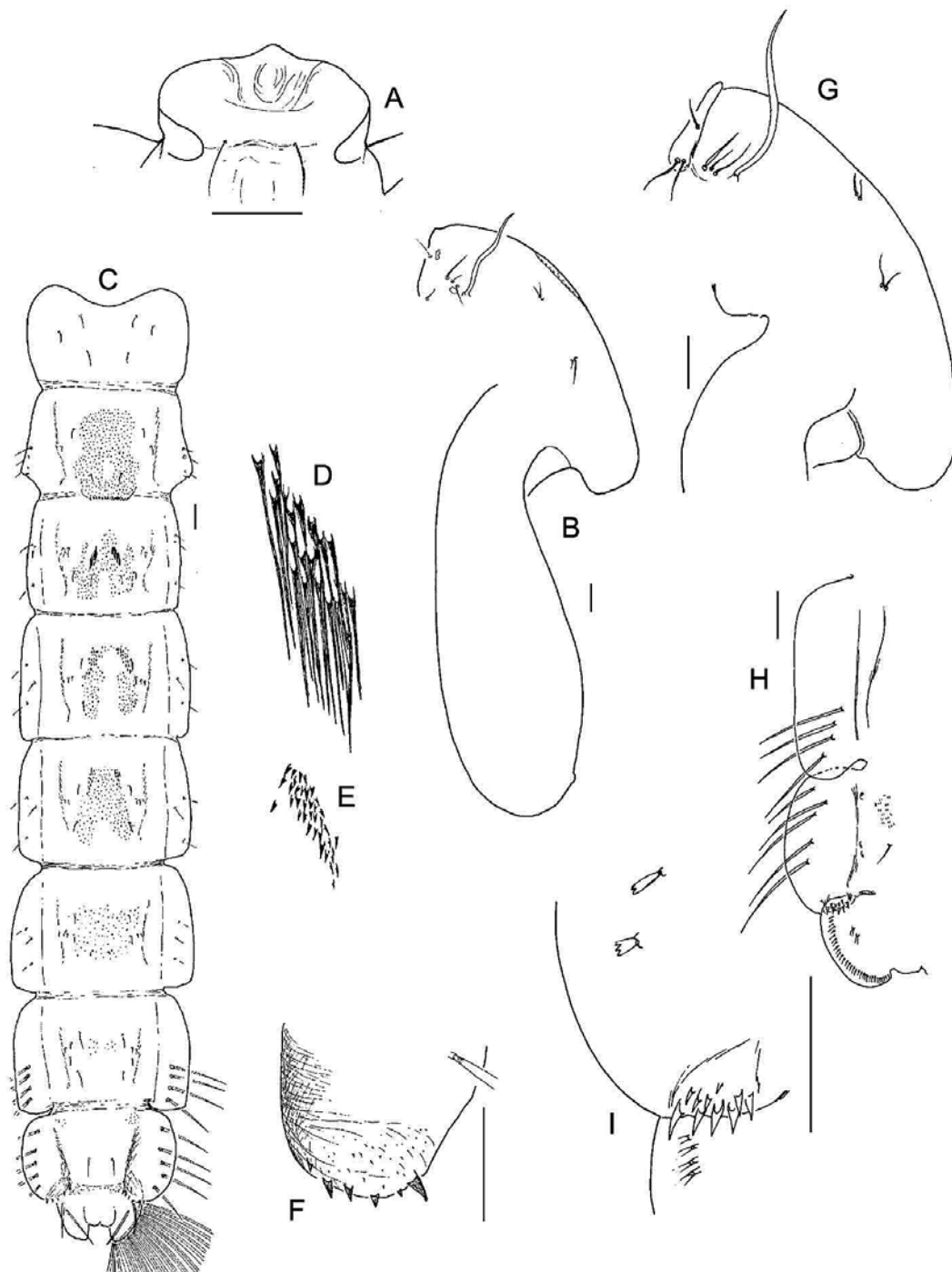


Fig. 29:

Tanytarsus sp. 41 (A-F) and *Tanytarsus* sp. 42 (G-I).

A: Frontal apotome. B & G: Thorax. C: Abdomen. H: TVIII-IX. D-E: Armature on TIII-IV. F & I: Comb of segment VIII.

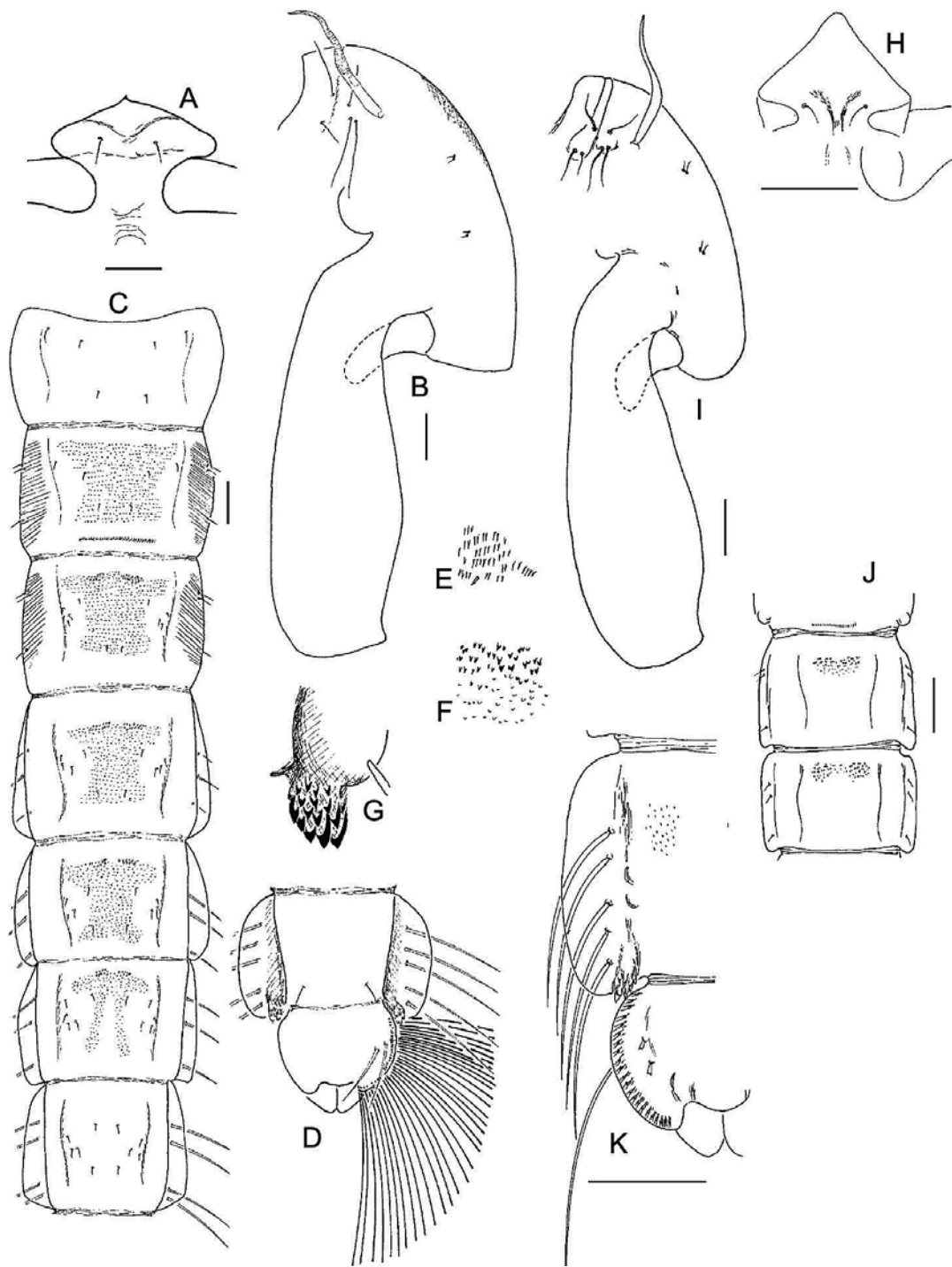


Fig. 30:

Tanytarsus sp. 43 (A-G) and *Tanytarsus* sp. 44 (H-K).

A & H: Frontal apotome. B & I: Thorax. C: T1-VII. J: TIII-IV. D & K: TVIII-IX. E-F: Armature on sternite II-III. G: Comb of segment VIII.

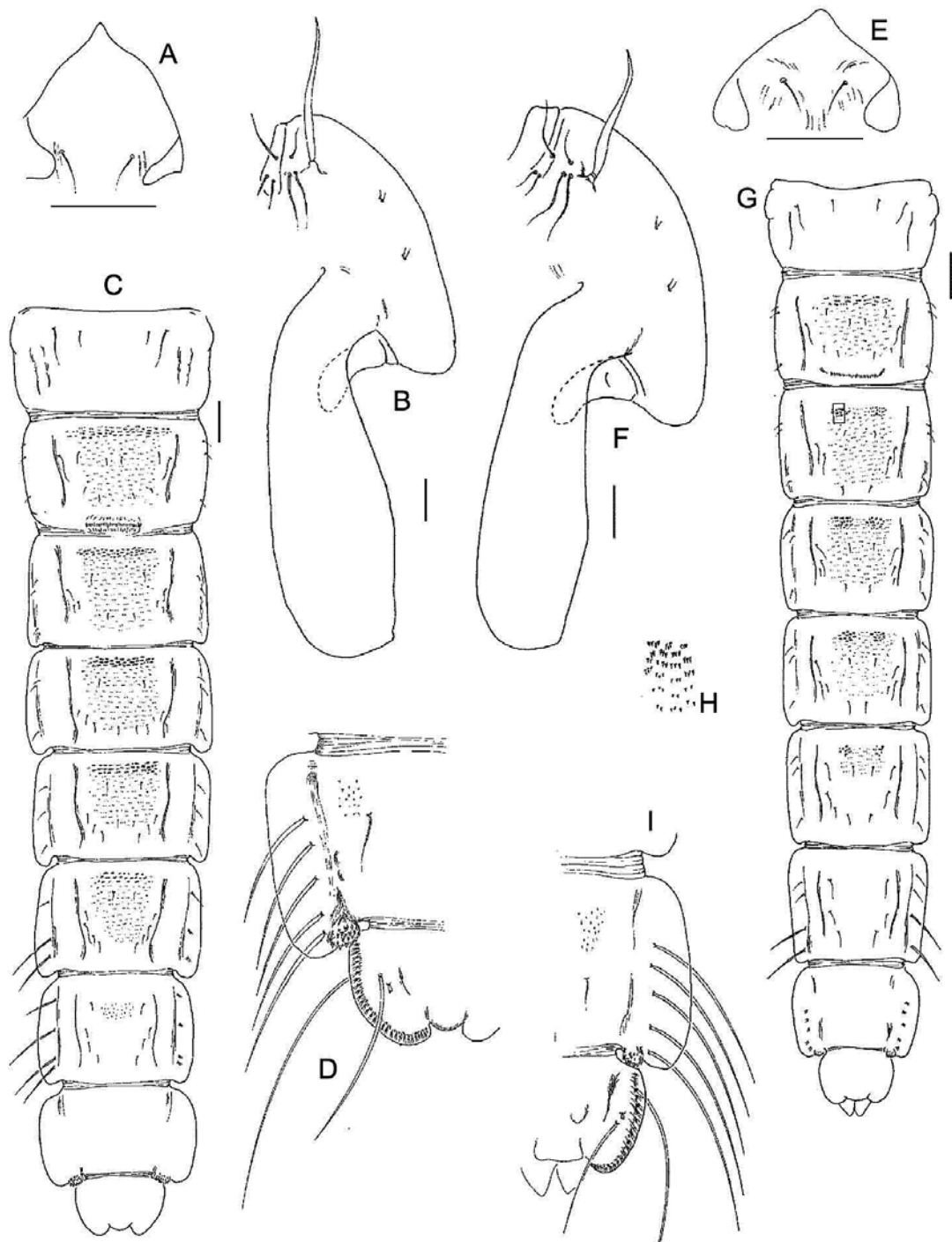


Fig. 31:

Tanytarsus sp. 45 (A-D) and *Tanytarsus* sp. 46 (E-I).

A & E: Frontal apotome. B & F: Thorax. C & G: Abdomen. D & I: TVIII-IX. H: Point patches on TIII.

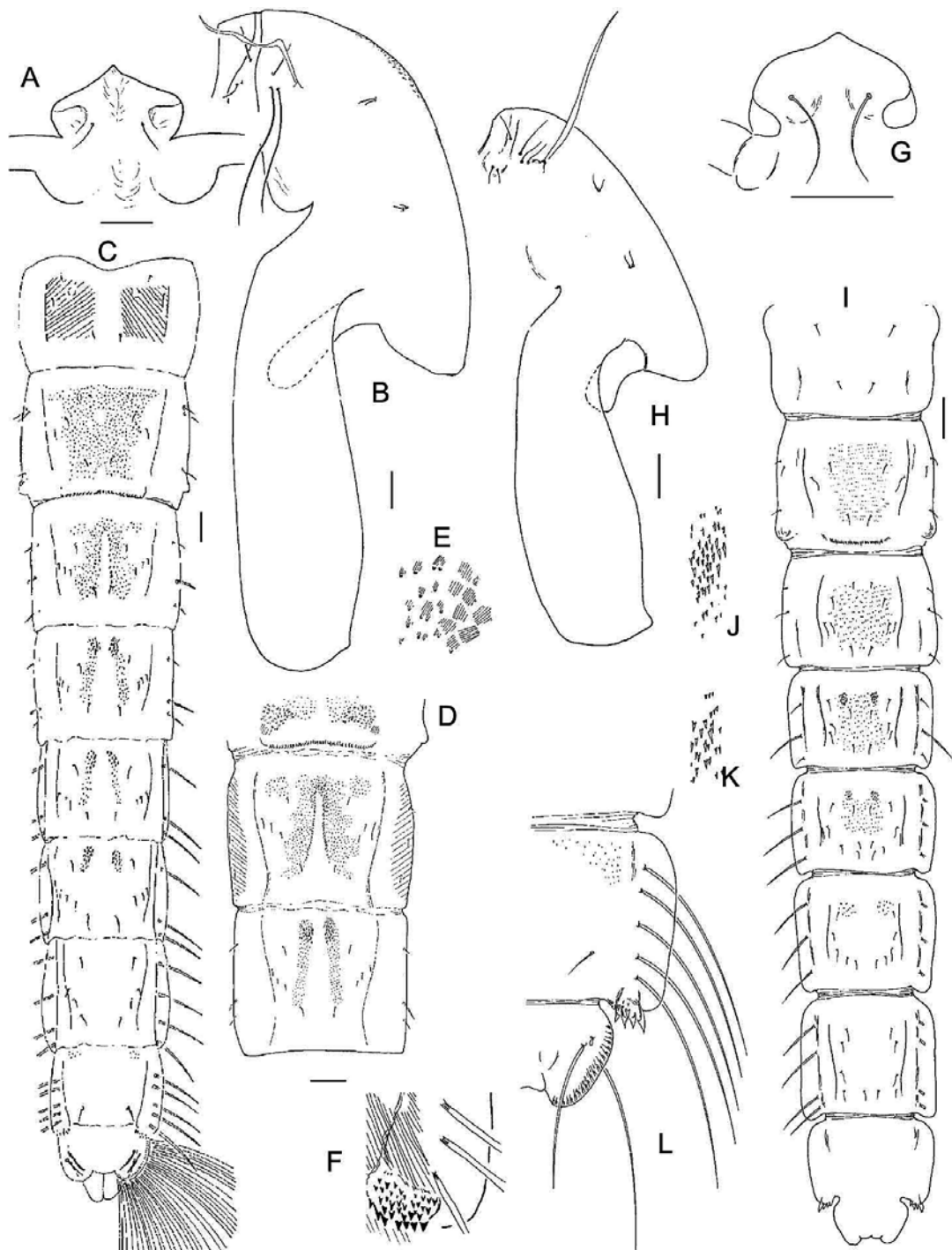


Fig. 32:

Tanytarsus sp. 47 (A-F) and *Tanytarsus* sp. 48 (G-L).

A & G: Frontal apotome. B & H: Thorax. C & I: Abdomen. D: TII-IV. L: TVIII-IX. E: Armature and pigmentation on TII posteriorly. J-K: Point patches on TIV-V. F: Comb of segment VIII.

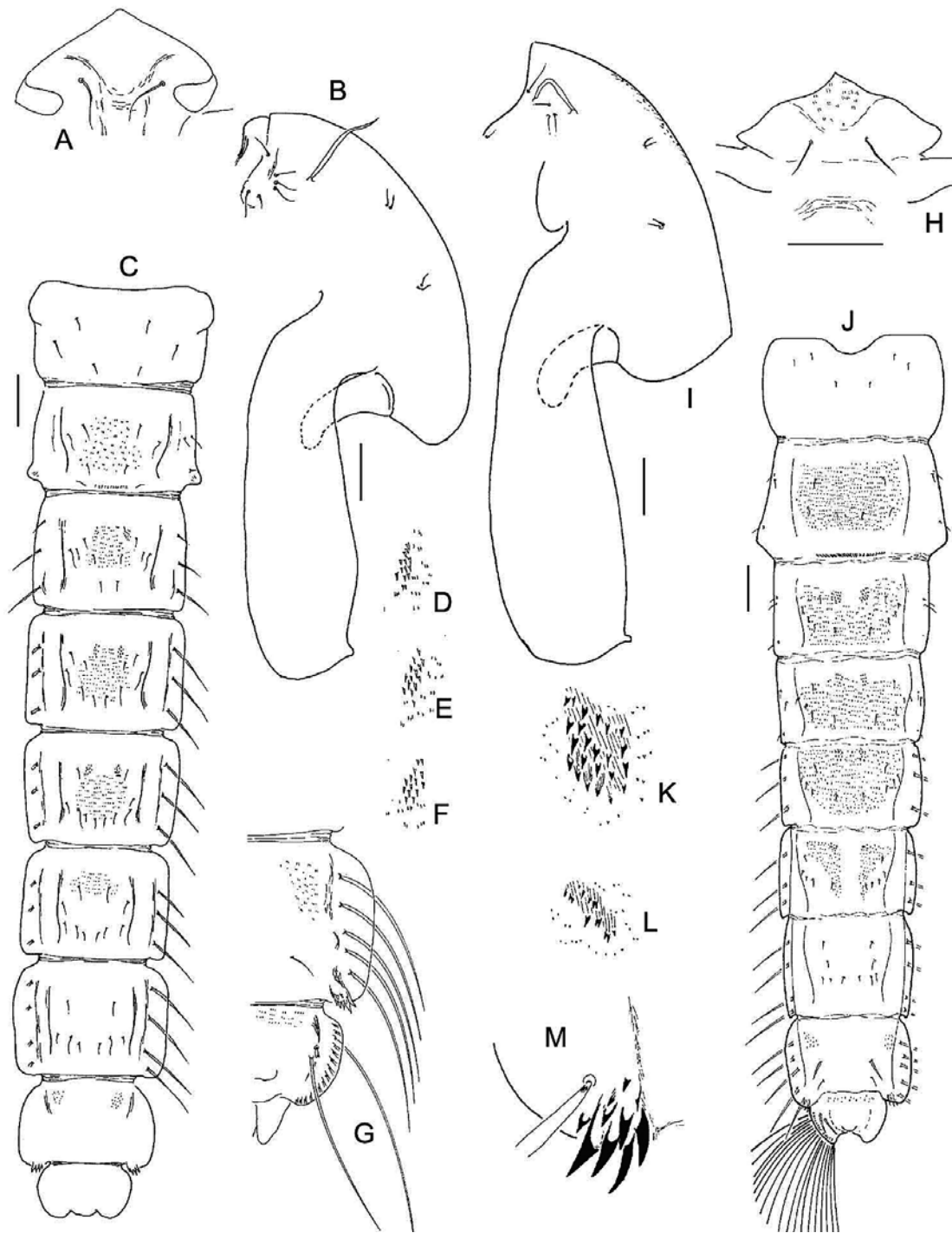


Fig. 33:

Tanytarsus sp. 49 (A-G) and *Tanytarsus* sp. 50 (H-M).

A & H: Frontal apotome. B & I: Thorax. C & J: Abdomen. D-F: Point patches on TIII-V. K-L: Point patches on TIII-VI. G: TVIII-IX. M: Comb of segment VIII.

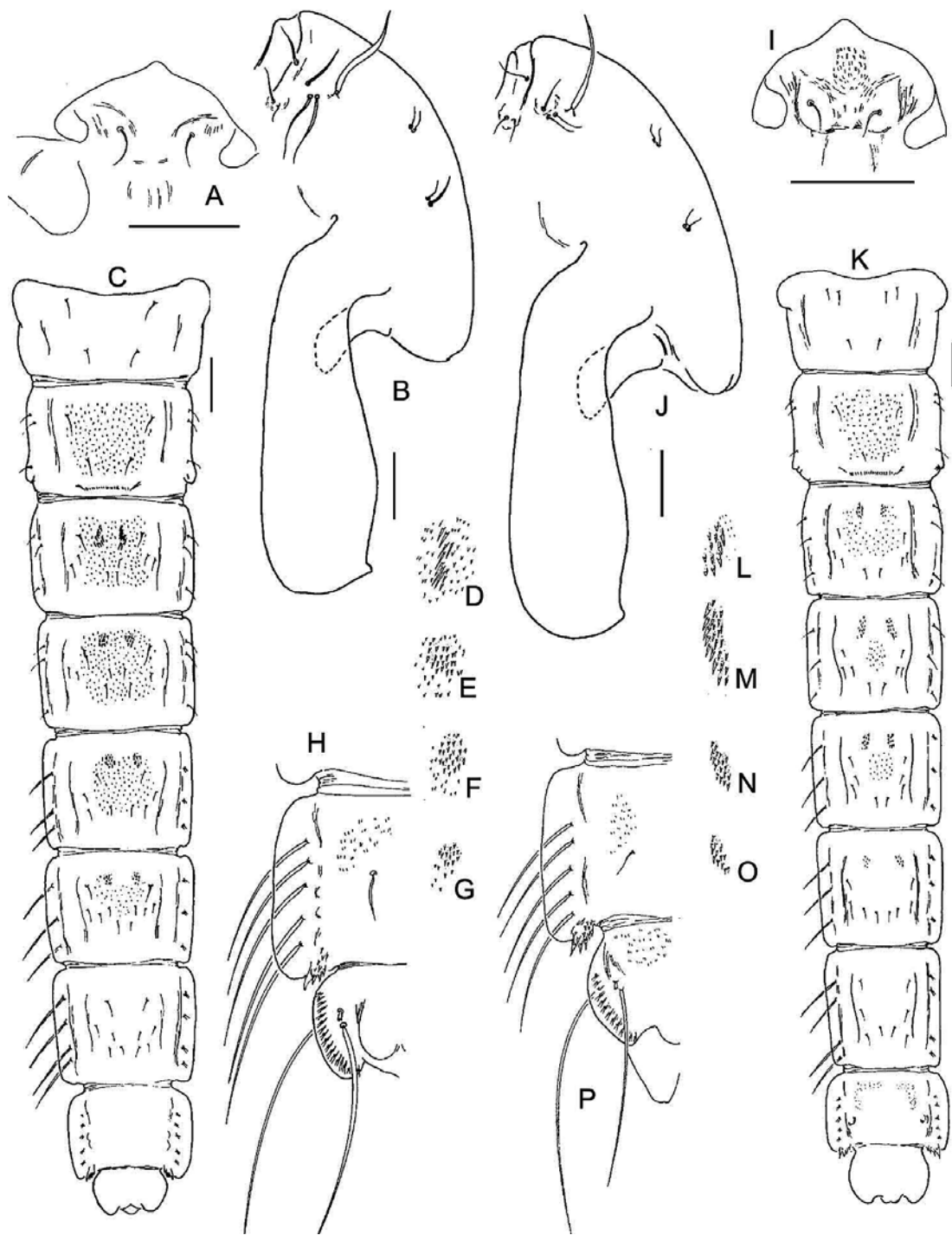


Fig. 34:

Tanytarsus sp. 51 (A-H) and *Tanytarsus* sp. 52 (I-P).

A & I: Frontal apotome. B & J: Thorax. C & K: Abdomen. D-G & L-O: Point patches on TIII-VI. H & P: TVIII-IX.

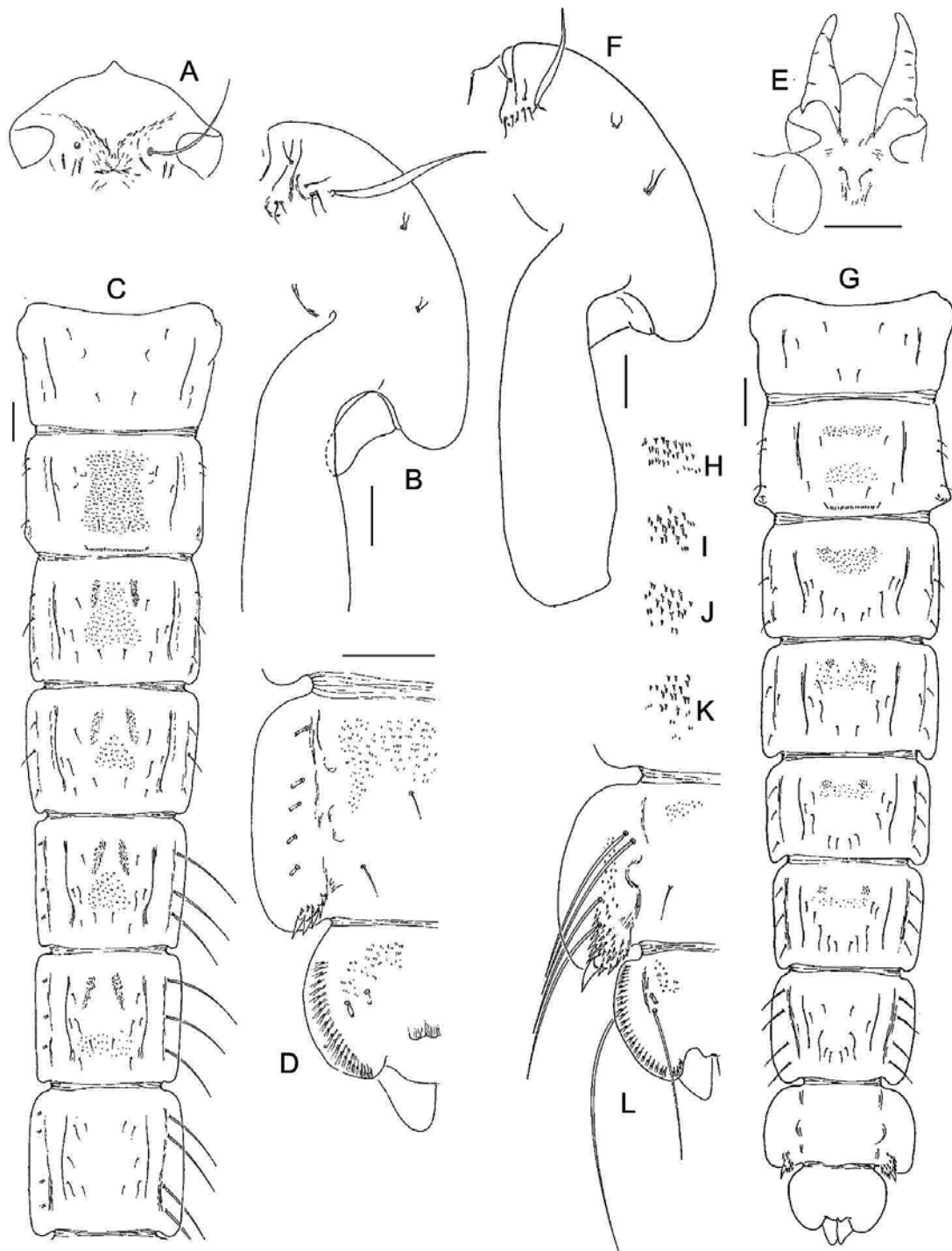


Fig. 35:

Tanytarsus sp. 53 (A-D) and *Tanytarsus* sp. 54 (E-L).

A & E: Frontal apotome. B & F: Thorax. G: Abdomen. C: T1-VII. D & L: TVIII-IX. H-K: Point patches on TIII-VI.

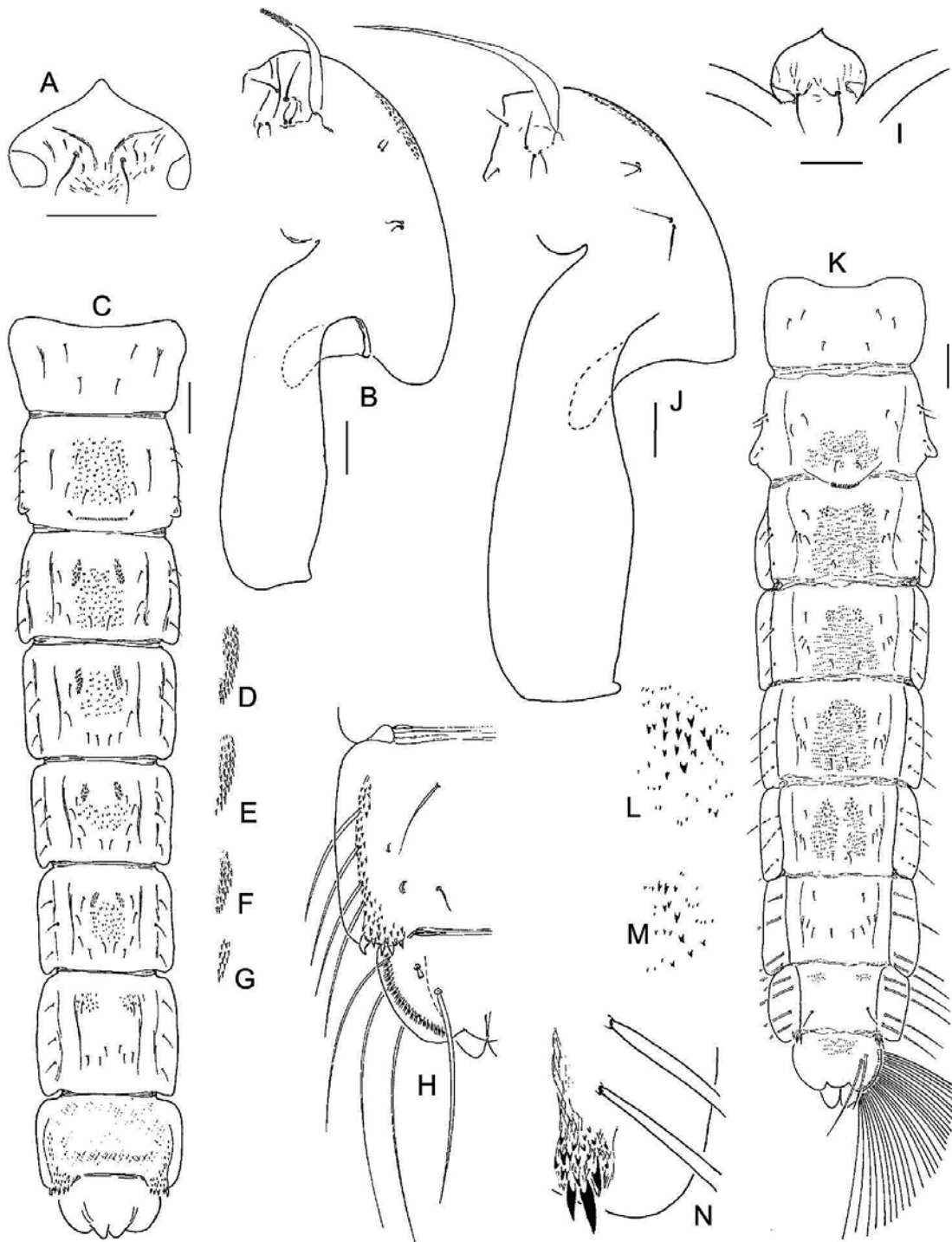


Fig. 36:

Tanytarsus sp. 55 (A-H) and *Tanytarsus* sp. 56 (I-N).

A & I: Frontal apotome. **B & J:** Thorax. **C & K:** Abdomen. **D-G:** Point patches on TIII-VI. **H:** TVIII-IX.

L-M: Armature on TIII and TVI. **N:** Comb of segment VIII.

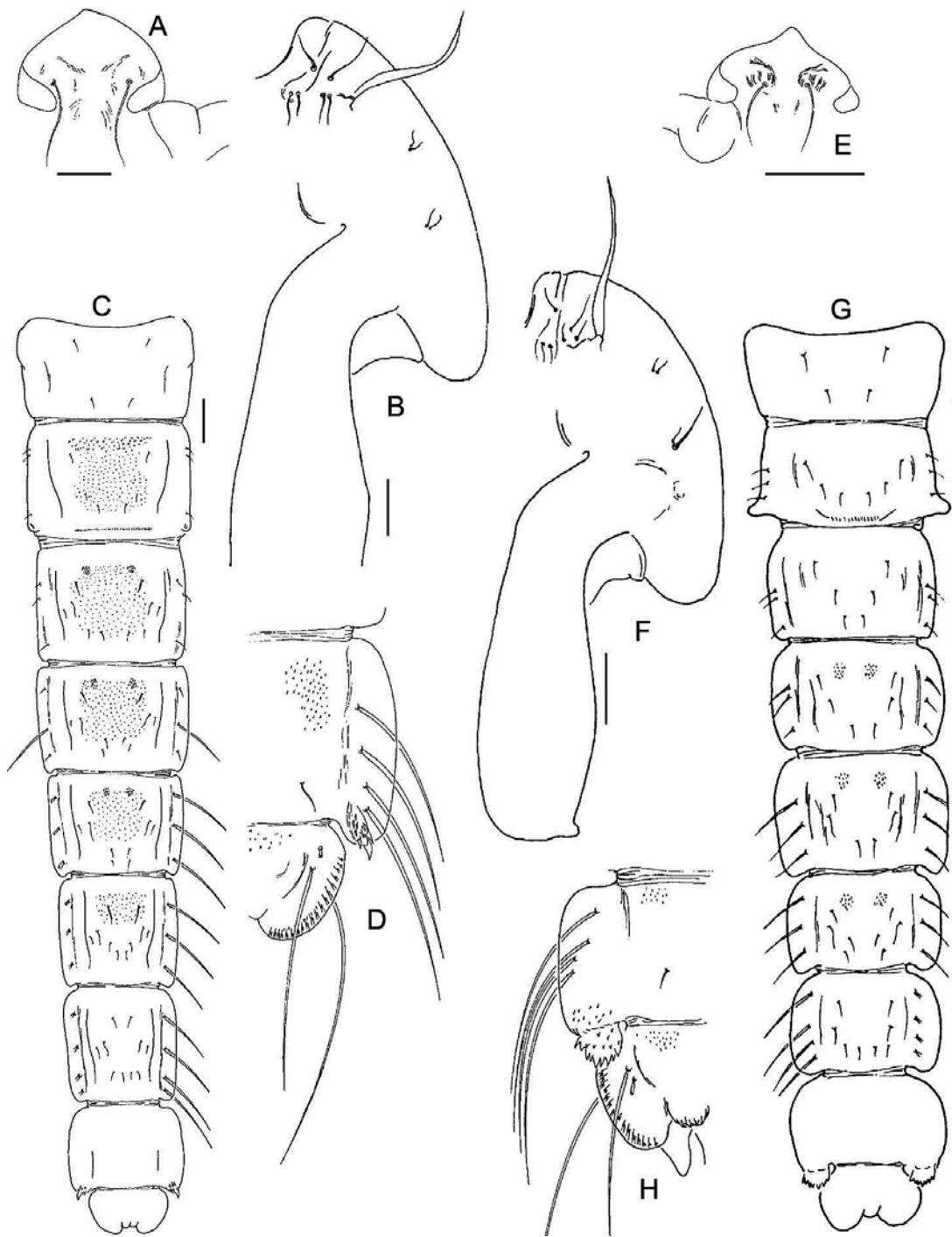


Fig. 37:

Tanytarsus sp. 57 (A-D) and *Tanytarsus* sp. 58 (E-H).

A & E: Frontal apotome. B & F: Thorax. C & G: Abdomen. D & H: TVIII-IX.

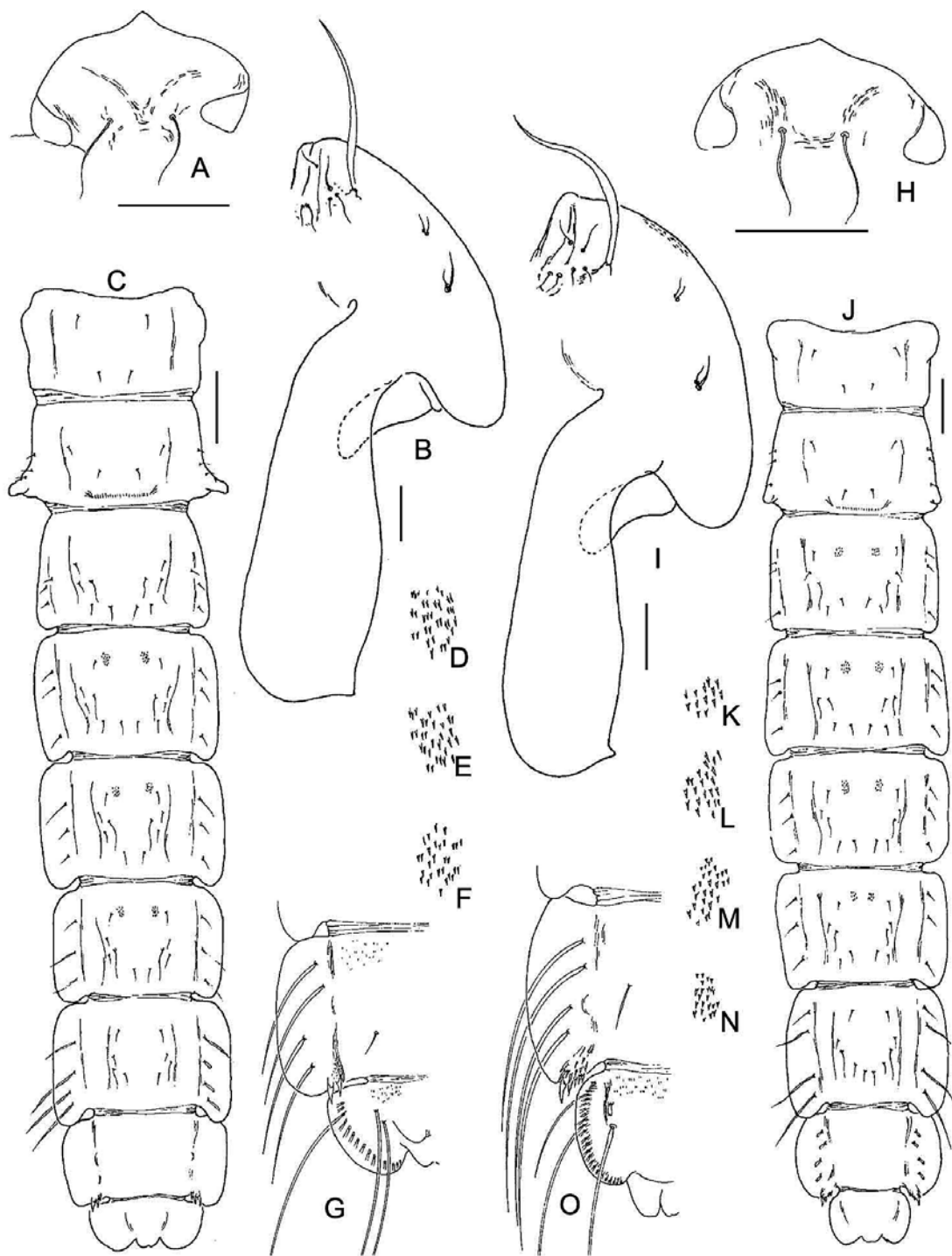


Fig. 38:

Tanytarsus sp. 59 (A-G) and *Tanytarsus* sp. 60 (H-O).

A & H: Frontal apotome. B & I: Thorax. C & J: Abdomen. G & O: TVIII-IX. D-F: Point patches on TIV-VI. K-N: Point patches on TIII-VI.

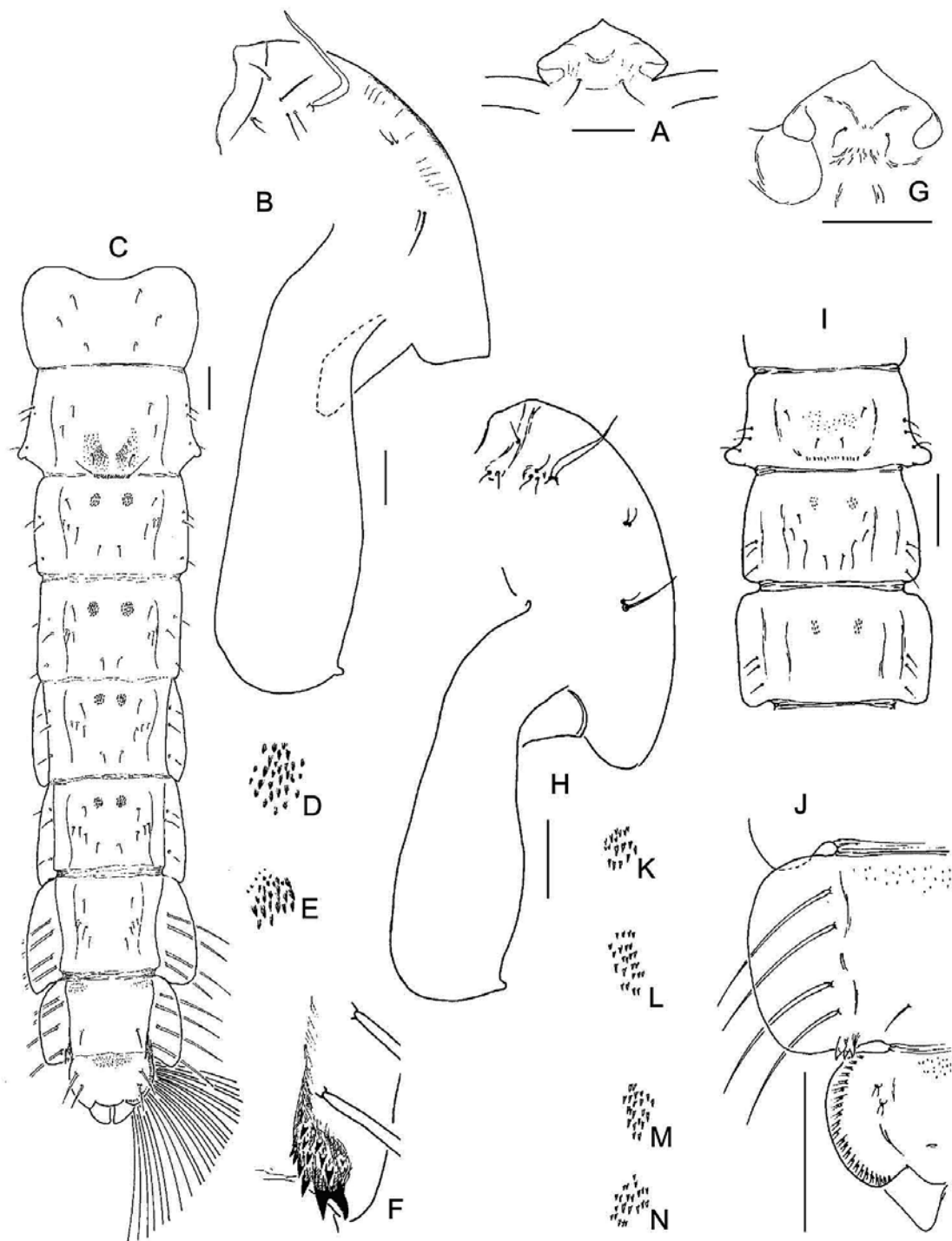


Fig. 39:

Tanytarsus sp. 61 (A-F) and *Tanytarsus* sp. 62 (G-N).

A & G: Frontal apotome. **B & H:** Thorax. **C:** Abdomen. **I:** TIII-IV. **J:** TVIII-IX. **D-E:** Point patches on TIII and TVI. **K-N:** Point patches on TIII-VI. **F:** Comb of segment VIII.

