

**A new species of the Neotropical scale insect genus
Laurencella Foldi, 1995, from Guyana
(Hemiptera, Coccoidea, Monophlebidae, Llaveiini)**

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Abstract. – The adult female of a Neotropical scale insect from Guyana, *Laurencella jonmartini* n. sp., is described and illustrated with the third-instar female of the possible same species. Each has distinctive morphological features. The adult female possesses circular, convex cribriform cicatrices on the venter of the posterior abdominal segments and dorsal groups of large ampulliform and other setae with spines and pores, all in a symmetrical arrangement, each group named here a *setarium*, a remarkable characteristic of the species. The third-instar females of possibly the same species also possess *setaria* but they are of a slightly different structure, each comprising a dense group of short and long spines, each setarium secreting a series of white, stud-like projections in longitudinal rows on the dorsum and margin.

Résumé. – Une nouvelle espèce de Cochenille néotropicale du genre *Laurencella* Foldi, 1995, du Guyana (Hemiptera, Coccoidea, Monophlebidae, Llaveiini). La femelle adulte de *Laurencella jonmartini* n. sp. est décrite et illustrée, ainsi que le troisième stade possible de celle-ci ; chacun présente des caractères morphologiques remarquablement distinctifs. La femelle possède des cicatrices cribriformes convexes sur la face ventrale des segments postérieurs de l'abdomen et des groupements symétriques de larges soies ampulliformes et d'autres soies, épines et pores, le tout formant une unité sécrétrice appelée ici *setarium*, sur la face dorsale. Le troisième stade femelle est reconnaissable par les *setaria* constitués par des groupements denses d'épines courtes et d'épines longues et quelques pores rassemblés en unité sécrétrice, formant de remarquables touffes de sécrétions en lignes longitudinales dorsales et marginales.

Keywords. – Scale insects, Neotropical region, morphology, taxonomy.

During a field mission to study scale insect diversity in Mexico in May and June, 1987, in various biotopes, particularly mountains (La Michilia and Acapulco), desert (La Mapimi), and rain forest (Los Tuxtlas), numerous archaococcoids were collected by the first author. One of these was the type species of *Laurencella*, *L. marikana* Foldi, 1995, found at Las Cruces (Chiapas), on the roots of *Acacia pennatula* (Schltdl. & Cham.) Benth. (Fabaceae) under a wide stone. *Laurencella* is a Neotropical genus and presently includes another three species: *L. colombiana* Foldi & Watson, 2001, from Colombia, a pest of avocado trees (*Persea americana* Mill., Lauraceae), *L. taunayi* (Hempel, 1920) from Brazil, and *L. uhleri* (Signoret, 1876) from Ecuador. The new species now brings the number to five in the genus. *Laurencella taunayi* was described originally as *Icerya taunayi* but UNRUH & GULLAN (2008) transferred the species to *Laurencella*. *Laurencella uhleri* was described originally as *Ortonia uhleri* by SIGNORET (1876) and was made the type-species of *Ecuadortonia* Ben-Dov by BEN-DOV (2004) but the genus name was treated as a synonym of *Laurencella* by WILLIAMS & GULLAN (2008).

The new species described here differs in many respects from the four species already in the genus and the definition of *Laurencella*, which follows, has been modified to accommodate the new species rather than erect a new genus for it.

MATERIAL AND METHODS

The term *setarium* refers to the setal groups, spines, and pores distributed on the dorsum and margins. Other terms used are the same as those in FOLDI (1995), FOLDI & WATSON (2001) and WILLIAMS & GULLAN (2008).

The specimens were stained and slide-mounted using the usual method for preparing scale insects. Each main illustration shows the dorsum on the left and the venter on the right, with enlargements of important structures around the margins. The setaria are illustrated diagrammatically to show their positions and only the general distribution of the setae and pores. Because each setarium may possess as many as 200 setae, these proved difficult to illustrate in detail in such a small space.

TAXONOMY

The genus *Laurencella* is one of six genera presently comprising the tribe Llaveiini Morrison, 1927, redefined recently by WILLIAMS & GULLAN (2008). The other five genera are *Llaveia* Signoret, 1876, *Llaveiella* Morrison, 1927, *Protortonia* Townsend, 1898, *Neohodgsonius* Foldi, 1999, and the genus *Corandesia* Foldi, described only recently by FOLDI (2009).

Adult females of *Laurencella* can be identified from the key to genera of the Llaveiini given by WILLIAMS & GULLAN (2008), but *Corandesia* would key out to *Protortonia*. *Corandesia* can be distinguished readily from *Protortonia* in having a well-developed tentorium and labium (mouthparts absent or vestigial in *Protortonia*) and five pairs of abdominal spiracles (seven pairs in *Protortonia*).

Genus *Laurencella* Foldi, 1995

Laurencella Foldi, 1995 : 166. Type-species: *Laurencella marikana* Foldi, 1995, by monotypy.

Diagnosis. – Adult female oval, derm covered by a dense pilosity. Antennae each 8 or 9 segmented. Eyes close to scape, each laterad to antennal base. Mouthparts well developed, with labium apparently 3 segmented. Thoracic spiracles with or without atrial or perispiracular pores. With 7 pairs of abdominal spiracles, each spiracle without atrial pores and with or without perispiracular pores. Legs well developed with few setae. Claw without denticle, with a pair of acute setose digitules. A single large smooth surfaced cicatrix present posterior to vulva; numerous smaller cribriform cicatrices present on venter of abdomen or a small number arranged in a U-shaped distribution on posterior segments of abdomen. Margins and submargins with collared setae around body; hair-like and flagellate setae scattered. Spines numerous, of different shapes and sizes, and spinose setae present on dorsum, either distributed evenly over surface or forming setaria distributed in longitudinal rows. Multilocular pores randomly distributed, each with 3-6 locular centres and with 6-14 outer loculi.

Comments. – The species in this genus are mainly restricted to the Neotropical region and include some of economic importance. All species in the genus possess well developed mouthparts, seven pairs of abdominal spiracles and cribriform cicatrices.

Key to species for adult females of *Laurencella*

1. One large smooth-surfaced cicatrix only present posterior to vulva 2
 - One large smooth surfaced cicatrix absent posterior to vulva but with a cluster of about 60 cicatrices present in this position *Laurencella uhleri* (Signoret)
2. Setaria present in longitudinal rows on dorsum. Cribriform cicatrices present on venter numbering six in a U-shaped distribution *L. jonmartini* n. sp.
 - Setaria absent from dorsum. Ventral cribriform cicatrices not in a U-shaped distribution, present numbering many more than six 3

3. Setose cribriform cicatrices present on venter in addition to cribriform cicatrices *L. markiana* Foldi
 – Setose cribriform cicatrices absent from venter, only cribriform cicatrices present 4
 4. Cribriform cicatrices on venter numbering over 30 across segments *L. taunayi* (Hempel)
 – Cribriform cicatrices on venter numbering up to 100 between each segment
 *L. colombiana* Foldi & Watson

***Laurencella jonmartini* n. sp.** (fig. 1)

HOLOTYPE : adult female, Guyana, Mazaruni-Potaro, Kaieteur Falls top, savannah area, 10.VI.2006, *J. H. Martin coll.* Deposited in The Natural History Museum, London (NHM).

External appearance. – Body oval, 4.0 mm long, 2.5 mm wide; derm membranous, with well-developed pilosity mostly forming setal + spine groups, a remarkable characteristic of the species.

Description on microscope slides

Antennae 9 segmented; each antenna 650 µm long; segments with few setae, mostly with 1 or 2 long setae, 150-180 µm long and 1-3 fleshy setae; very small sensory organs associated with fleshy setae on 4th and 5th segments; apical segment 110 µm long, 70 µm wide, with 3-4 long setae each 220-280 µm, plus one 170 µm long, 4 shorter setae each 50-70 µm long, and about 5-6 stick fleshy setae each 50-65 µm long.

Eyes very close to scapes laterad of each antenna.

Clypeolabral shield well developed, 500 µm long; labium probably 3 segmented, apex with about 20 setae each with weakly enlarged tip.

Mesothoracic spiracles each 105 µm wide, with about 9-10 small, perispiracular pores, each 7-8 µm wide. Metathoracic spiracles each 135 µm wide, with about 12-14 perispiracular pores. Each spiracle with an apodeme about 120 µm long. Abdominal spiracles present numbering 7 pairs; each atrium small, about 18-20 µm long, 13-15 µm wide, with about 4-5 constrictions or corrugations, without atrial and perispiracular pores.

Legs well developed. Metathoracic legs : coxa 190 µm long, 190 µm wide; with 8 setae, each 50-60 µm long; trochanter + femur 700 µm long; each trochanter with 3 campaniform sensilla on each side, ventrally with 3 setae each 110-130 µm long, and with a long trochanteral seta about 280 µm long; femur with setae 60-110 µm long; tibia 590 µm long, 95 µm wide, ventrally with short, stout spinose setae, about 30 µm long; setae laterally and dorsally, 75-100 µm long; tarsus 330-340 µm long, 70 µm wide, with a pair of digitules each 50 µm long, and stout spinose setae, 30 µm long ventrally, and also with a few setae 50-60 µm long laterally and dorsally; claw 75 µm long without denticle but with a pair of pointed digitules, 42 µm long. Spinules present in medial areas of most abdominal segments. Anal tube with about 2 circles of polygonal pores at inner end; anal opening 165 µm wide.

Dorsum. Dorsal setae fairly evenly distributed over surface, very variable in length and shape, comprising large straight parallel-sided spinose setae, large ampulliform setae, collared setae, hair-like setae and flagellate setae; mostly forming setal groups, each group named here a setarium, and comprising: 1) ampulliform setae, each 30-40 µm long, numbering 90-200 or more, all pointing upwards when viewed from above, those laterally, numerous, directed towards centre; 2) straight, wide spinose setae, mostly parallel-sided, bluntly pointed and sparsely scattered surrounding ampulliform setae; 3) externally small pores, each 5-6 µm wide, with a short central tube about 4-5 µm long, present in 2-3 circular rows, and a few multilocular pores scattered; 4) hair-like setae, each 60-120 µm long, also shorter flagellate setae 20-60 µm long located at periphery directed towards centre.

These setaria distributed in more or less 8 longitudinal rows on dorsal surface. Widest setaria located on head and thorax.

Most other dorsal setae present, each 80-170 µm long with a well pronounced basal socket, and smallest setae, each 30-45 µm long, with basal socket. Multilocular pores, each 12 µm wide, mostly with triangular centre and 6-9 outer loculi, randomly distributed throughout; other multilocular pores, each 12 µm wide with quadrilocular or quinquelocular centre and 12-14 outer loculi scattered throughout, weakly distributed around small pores. Smaller circular pores, each with trilocular centre and with 3 or 4 elongate outer loculi, sparse; rectangular pores each with quadrate centre and with 4 elongate outer loculi, sparse.

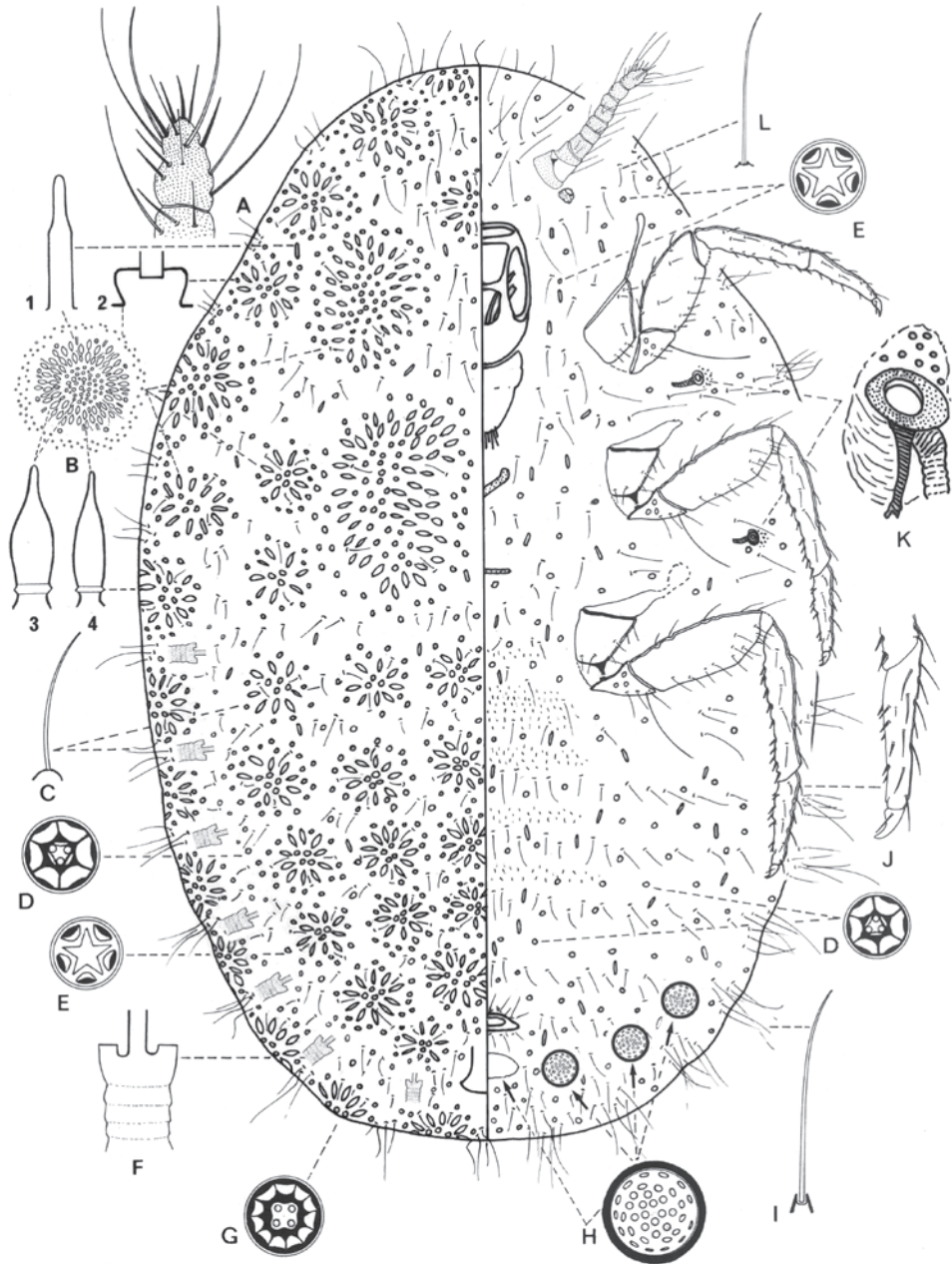


Fig. 1. – *Laurencella jonmartini* n. sp., adult female. A, apical segment of antenna; B, a setarium with : 1, large spinose seta; 2, profile view of small pore located on periphery of setarium; 3 and 4, ampulliform setae located at centre and first and widest circle of setarium; C, flagellate seta; D, multilocular pore with trilocular centre and 6 outer loculi; E, quinquelocular pore with star-like centre; F, abdominal spiracle; G, multilocular pore with quadrilocular centre; H, circular, convex cribriform cicatrices; I, collared seta; J, tarsus and claw; K, thoracic spiracle with perispiracular pores; L, hair-like seta.

Venter. A single oval cicatrix, about 155 µm long, 90 µm wide, present posterior to vulva; circular convex cribriform cicatrices, each 50-65 µm in diameter, present on submargin on posterior segments of abdomen in a U-shaped arrangement, three on each side. Ventral abdominal setae abundant across segments, mostly hair-like; less abundant but longer setae present on head and thorax; hair-like setae, each 50-200 µm long, present on medial and submedial areas of thorax, and other setae across each abdominal segment, each seta about 50-70 µm long but many about 130-180 µm on medial line and submargins; setae and pores on thorax more frequent on submargins. Each seta more than 50 µm long with well-developed collar-like basal sockets. Margins and submargins with collared setae 190-300 µm long, and with a few others up to 400 µm long or more. Multilocular pores, each 10 µm wide, with trilocular centre and 6-9 outer loculi, also pores quadrilocular and quinquelocular centre, scattered throughout. Pores, each 12 µm wide with quadrilocular centre and 12-14 outer loculi, frequent, throughout. Smaller pores, each 7-8 µm wide, present near peritreme of spiracles. Multilocular pores each with star-like centre and with 6 outer loculi, most frequent throughout.

Etymology. – The new species is named in honour of the collector, Dr. Jon Martin, Department of Entomology, The Natural History Museum, London, UK.

Third instar female of *Laurencella ?jonmartini* (fig. 2-3)

Material examined. – Two specimens on two slides, Guyana, Mazaruni-Potaro, Kaieteur Falls top, savannah area, 10.VI.2006, undetermined woody broad-leaved plant, under leaf surface or on stem/petiole, *J. H. Martin coll.* (NHM); 1 specimen with identical data, used for DNA studies, deposited in the Australian National Insect Collection, Canberra, Australia.

External appearance. – Body oval, 3.2 mm long, 2.3 mm wide, dorsum convex, reddish-brown, with a series of white stud-like secretions formed from dorsal setaria, in submedial, submarginal and marginal longitudinal rows, giving the insect a miniature saurian appearance (fig. 3).

Description on microscope slides

Antennae 7 segmented, 580 µm long; apical segment 180 µm long, 60 µm wide, with 6 or 7 stout fleshy setae, each 50-60 µm long and one longest seta 220 µm long; antennal segment III with a short setal sensillum, 15 µm long. Eyes present laterad to scape. Mouthparts well developed, clypeolabral shield 455 µm long, labium apparently 3 segmented, 210 µm long, apex with 10 setae 35-40 µm long. Thorax well developed; thoracic spiracles each with peritreme 80-90 µm wide with about 10 perispiracular pores, each with trilocular centre and 9 outer loculi. Abdominal spiracles probably numbering 7 pairs, small and difficult or impossible to detect because masked by setaria and secretion present on margins. Anal tube 70 µm long, inner end sclerotised with polygonal pores; mid-area of anal tube with a group of multilocular pores; anal opening, 60 µm wide,

Legs well developed but of unequal lengths: prothoracic legs 1.14 mm long, mesothoracic legs 1.40 mm long, and metathoracic legs 1.50 mm long. Metathoracic legs: coxa 40-50 µm long; trochanter + femur 600 µm long; trochanter with 3 campaniform sensilla on each surface, with also a trochanteral seta 260 µm long and with about 5 setae 30-75 µm long; femur ventrally with short stout setae, 22-30 µm long; tibia 450 µm long, dorsally with few setae, mostly 100-120 µm long, ventrally with short stout setae, 20-30 µm long; tarsus 210 µm long, ventrally with short fine setae, 16-22 µm long; claw curved, stout, 65 µm long, with digitules setose, each 35 µm long.

Dorsum. – Dorsum covered by a series of setaria distributed in submedial, submarginals and marginal longitudinal rows; each row comprising about 12-14 setaria. Each setarium on raised and rounded prominence, with spines of varying lengths and thickness. Each setarium comprising : 1) short circular, straight spines, each with blunt apex, about 25-33 µm long, located mostly in centre, their number varying between about 15-35; 2) numerous long straight spines, each mainly 110-220 µm long with sharply pointed apex, their number varying between about 30-87; also with a few number of spines, each only 50-80 µm long; 3) few hair-like setae 120-160 µm long; 4) a group of multilocular pores around perimeter. In addition, each setarium on margin with 2 or 3 long setae, 500-700 µm and with some setae each up to about 850 µm long. Dorsal derm with abundant short, slightly pointed spines, each 30-40 µm long, distributed throughout each segment of body.

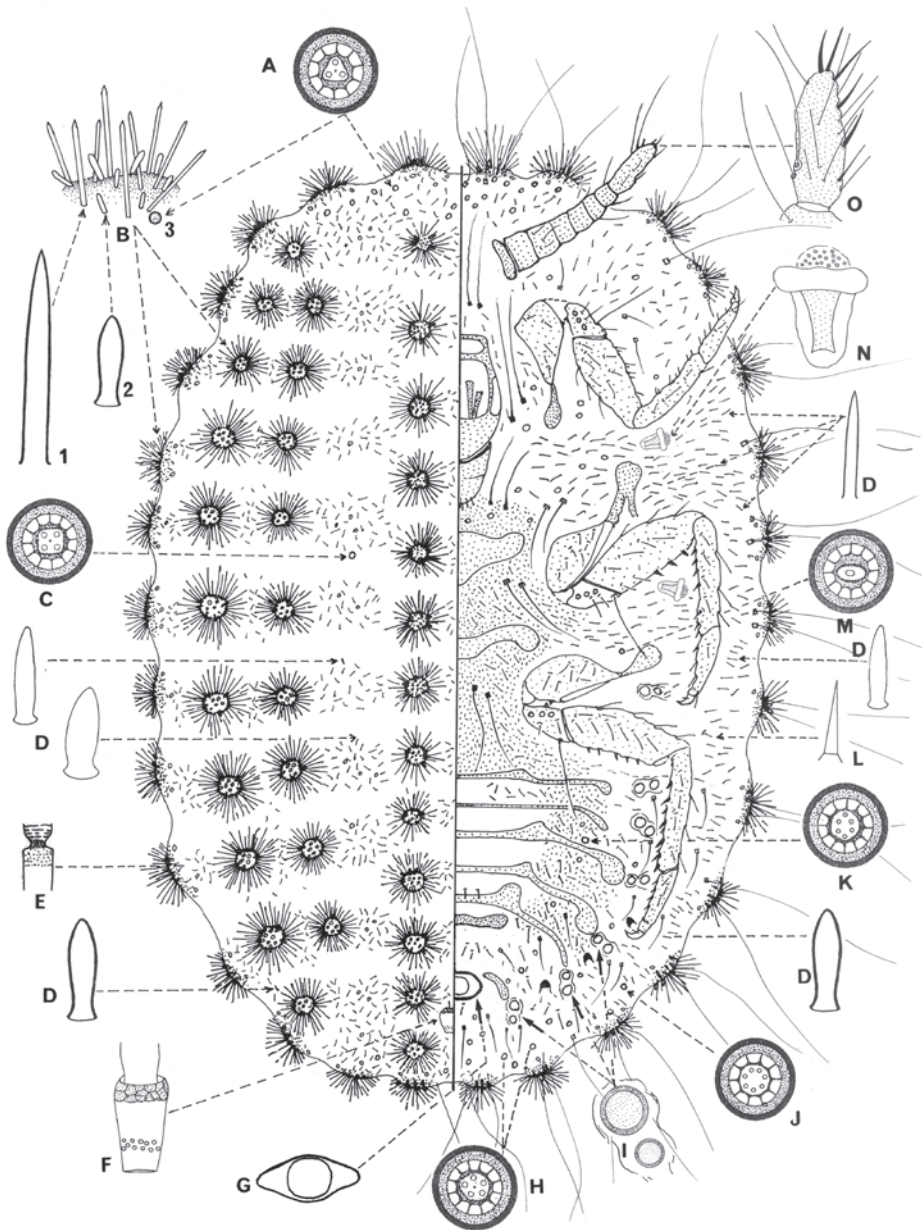


Fig. 2. — *Laurencella ?jonmartini* n. sp., third-instar female. A, multilocular pore with triangular centre; B, a setarium, details comprising : sharply pointed long spine (1), short spine (2) and multilocular pore (3); C, multilocular pore with quadrate centre; D, short spines with different shape; E, abdominal spiracle; F, anal tube; G, a single cicatrix posterior to vulva; H, multilocular pore with quinquelocular centre; I, small cicatrices in pairs on margin of abdomen; J, multilocular pore with seven loculi in centre; K, multilocular pore with six loculi in centre; L, spinose seta; M, multilocular pore with oval centre; N, thoracic spiracle; O, apical segment of antenna.

Dorsal multilocular pores mainly circular, about 10-11 μm wide, many concealed by secretions from setaria; most pores with a trilocular centre and 10 outer loculi, also pores with quadrilocular centre and with 6 or 7 outer loculi, and other pores each with quinquelocular centre and an outer ring mainly with 6 loculi, all scattered throughout; most pores obscured by some secretion present.

Venter. – A single large circular cicatrix, 110 μm wide, present on medial posterior end of abdomen. Smaller cicatrices distributed in pairs on submargins on all abdominal segments, each cicatrix mostly about 20 μm wide, one cicatrix in a pair sometimes smaller about 12-15 μm wide.

Venter with much fewer short spines than on dorsum, each spine 30-35 μm long, scattered on head and thorax, and present only on submargin of abdomen. Longest spines 40-80 μm long (mainly 50 μm) distributed throughout but becoming much denser towards submargin where pointed laterally. Spinose setae, 70-80 μm long, sparsely scattered in medial areas of head, thorax and abdomen. Long hair-like setae, each 230-320 μm long, present on medial areas of head and thorax. Spines, setae and pores absent from abdominal segments II-VI in medial areas; posterior segments V-VII submedially, each with a pair of hair-like setae, 170-180 μm long, and with a few hairs and hair-like setae; also among spines on submargin, two long fine hair-like setae, 130 μm long, present on each segment of abdomen. Spinules densely distributed on medial and submedial areas of mesothorax and metathorax and particularly on abdomen, except on posterior segments.

Ventral multilocular pores absent from medial and submedial areas of abdominal segments II-VI but sparsely present on submarginal area; sparsely scattered on posterior abdominal segments VII and VIII. Head and thorax with pores, mostly with trilocular, quadrilocular, and seven-locular centres, scattered. Posterior segments of abdomen with trilocular, quadrilocular and quinquelocular centres, scattered.

Comments. – The morphology of the adult female and of the third-instar female of *L. ?jonmartini* is clearly different from that of other species of the genus *Laurencella*. The main differences are the presence of a series of dorsal setaria, each an association of spines, spinose setae and pores in a secretory unit, distributed in more or less 8 longitudinal rows on the dorsal surface. In the third-instar female, the setaria, each possess only short and long spines, different from those of the adult female, distributed in submedial, double submarginal



Fig. 3. – *Laurencella ?jonmartini* n. sp., third instar female. A colony of third instar females showing the dorsal secretions in longitudinal rows from setaria.

and marginal longitudinal rows on the dorsum. These setariae secrete a series of white, stud-like projections. The third instar females were collected separately from the adult female and, although they are all possibly conspecific, there is yet no direct evidence for this.

The combination of an anal ring containing pores at the inner end, and with more than three ventral cicatrices are characters that place this species in *Laurencella*.

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