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The identity and taxonomic status of the generic names *Schendylops* Cook, 1899, and *Schendylurus* Silvestri, 1907, and the proposal of *Orygmadyla*, a new related genus from Peru (Chilopoda: Geophilomorpha: Schendylidae)

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ABSTRACT

Examination of the intact syntype of *Schendyla grandidieri* DeSaussure & Zehntner, 1897, provides anatomical evidence that this species, type of the genus *Schendylops* Cook, 1899, is congeneric with *Schendylurus australis* Silvestri, type of the genus *Schendylurus* Silvestri, 1907. This specimen is designated *lectotype* of *grandidieri*, and is fully re-described and illustrated. All species heretofore placed in *Schendylurus* are transferred to *Schendylops*; a complete list is given, with geographic indications. *Schendylops spelaeus* Kraus, 1955, is redescribed from type material and designated type species of the new genus *Orygmadyla*. The relationships of *Schendylops* to other nominal genera of Schendylidae are discussed.

INTRODUCTION

Although the existence of generic names based upon inadequately described type species is a problem common to most groups of organisms, taxa within the arthropod classes Chilopoda and Diplopoda seem to be afflicted with more than their proportionate share of such an inheritance. One reason for this state of things was a tendency by several of the more influential and productive students of these groups - during the period 1890-1950 - to dispose of genera not personally known to them by imperiously declaring them to be *nomina nuda* or by replacing the enigmatic type species with others of unequivocal identity. Of course in many cases the original material of the troublesome species was either lost or located in museums unable or unwilling to send it out on loan. But far too often the neglect of uncertain type species has no better justification than carelessness or indifference.

By the time that someone in a more recent generation of investigators is able to resolve the identity of such arcane species, the genera which they represent are often renamed by someone having no way of knowing that junior synonyms are being proposed. When such younger names become established and gain some currency, there is an understandable resistance to their replacement by some forgotten wraith from the past, yet in a nomenclatorial system based on the principle of priority, the action should be taken, and of course, the sooner the better. When particular names, which have enjoyed a long and universal usage, are thus jeopardized, the International Code of Zoological Nomenclature provides for their conservation, but in most taxa of "myriapods" such cases are very rare simply because of a still rather rudimentary literature.

This long preamble is offered to introduce a case that exactly corresponds to the generalized example cited above. In the following pages we show that the inadequately-known name *Schendylops* of Cook (1899), must be used for the species currently referred to *Schendylurus* Silvestri (1907).

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HISTORICAL SUMMARY

An adequate comprehension of the chilopod family Schendylidae did not exist prior to 1912, in which year appeared the superb (and still unsuperceded) "Essai d'une monographie des Schendylina" by H.-W. Brölemann and Henri Ribaut. This masterly treatment, beyond praise for the quality of its presentation and clairvoyance of its conclusions, provided a sound basis for future work on the family, especially with its tropical representatives.

Among the several genera treated by Brölemann & Ribaut was *Schendylops*, nonchalantly proposed in a key couplet (without even an indication that the name was new) by O. F. Cook (1899) for a species from Madagascar named *Schendyla grandidieri* by Henri DeSaussure and Leo Zehntner in 1897. Although the original description and figures provided by the two Swiss authors were very good for the

time, they did not clearly depict the structure of the internal coxopleural glands of the last pair of legs (ironically and almost inevitably, those glands later assumed a primary importance in the definition of schendylid genera). Brölemann & Ribaut were of course aware of this deficiency, but were unable to correct it because the several syntypic specimens of *grandidieri* presented by DeSaussure to the Museum National d'histoire Naturelle were all defective in the body region concerned! Nonetheless, they concurred in the opinion of Cook that this Malagasy species represented a distinctive generic type. At a later place we return to their published commentary on the situation. For now, it is only to be marveled that the pains-takingly thorough Brölemann apparently did not consider that DeSaussure might have retained additional, possibly undamaged, type material at Genève.

Subsequent workers included *Schendylops* only in lists of dubious taxa until Otto Kraus revived it in 1955 to accomodate a new species of schendylid he studied from Peruvian material. In describing *Schendylops spelaeus*, Kraus accepted the genus as defined by Cook, and in so doing established the remarkable biogeographic situation of congeneric species in Madagascar and Peru, separated not only by an ocean but also a horde of species belonging to an apparently cognate genus.

The parallel, but unsuspected, course of *Schendylurus* was set in motion in 1907, with the description of the South African *S. australis* by Filippo Silvestri. The new taxon was contrasted only with *Schendyla* and *Pectiniunguis*; no account whatever was taken of *Schendylops* although Silvestri surely had seen Cook's 1899 treatment, and should have known the description of *grandidieri*. In any event, *Schendylurus* was accepted by Brölemann & Ribaut, who added a number of new species and proposed two subgenera, the nominate for African species and *Ploutoschendylurus* for those in South America.

By 1926, Attems (Handbuch der Zoologie 4: 350) omitted *Schendylops* alto-gether, nor did he mention it in "The Myriopoda of South Africa" (1928). However, in the definitive treatment of the family in "Das Tierreich" (1929), *Schendylurus* gained consentual acceptance, and was later used not only by Attems, but in many papers by Verhoeff, Lawrence, and most recently, Pereira & Minelli (1995), all treating African species. In the Neotropical fauna, *Schendylurus* was used in papers by Turk (1955), Kraus (1957), Crabill (1972), Pereira (1983, 1985), and Pereira et al. (1993, 1994, 1995).

Interestingly, although *Schendylops* was reinstated in the "Tierreich" treatment, where listed as a distinct genus, it was not distinguished from *Mesoschendyla* either in the key to schendylid genera nor in the respective generic accounts. Perhaps because of this equivocality, Kraus later (1954: 366) stated that "Wir halten *Mesoschendyla* Attems 1909 für identisch mit der bisher monotypischen Gattung *Schendylops* Cook 1899."

During our recent studies of various schendylid taxa, we had occasion to consider the status of *Mesoschendyla*, and its possible senior synonym, the long-neglected *Schendylops*. While studying schendylids at the Muséum National d'Histoire Naturelle in 1995, the second author reviewed the syntype material of *S. grandidieri*

seen by Brölemann & Ribaut, as well as, through the kindness of Dr. Hauser, an intact syntype which had been retained at Genève by DeSaussure. Examination of this latter specimen showed that the coxopleural glands are exactly as attributed to *Schendylurus*, i.e., two homogenenous (simple, unlobed) glands in each coxopleuron. As in this as in other character systems *grandidieri* seems unquestionably congeneric with *Schendylurus australis*, we believe that *Schendylops* must now be taken as the senior, and *Schendylurus* the junior, synonym.

1. Schendylops

Schendylops Cook, 1899, Proc. Ent. Soc. Washington, 4: 305. Type species:*Schendyla grandidieri* DeSaussure & Zehntner, 1897, by original designation.

Schendylurus Silvestri, 1907. Mitt. Naturh. Mus. Hamburg, 24: 245. Type species: *Schendylurus australis* Silvestri, by original designation. **New synonymy**!

Ploutoschendylurus Brölemann & Ribaut, 1912, Nouv. Arch. Mus. Hist. Natur., (5) 4: 115. Proposed with five species, none designated as type. Type species: *Schendylurus tropicus* Brölemann & Ribaut, 1911, by present designation. **New synonymy!**

Schendylurus Brölemann & Ribaut, 1912, Nouv. Arch. Mus. Hist. Natur. (5) 4: 97, 113.

Schendylota Chamberlin, 1950, Proc. Biol. Soc. Washington, 63: 155. Type species: *Schendylota varipicta* Chamberlin, by original designation. **New synonymy**!

Nesondyla Chamberlin, 1950, Zoologica (New York), 35: 135. Type species: *Nesondyla nealota* Chamberlin, by original designation. **New synonymy**!

Koepckeiella Kraus, 1954, Senckenbergiana biol. 34: 311. Type species: *Koepckeiella titicacaensis* Kraus, by original designation. **New synonymy**!

Schendylurus Pereira & Minelli, 1996, Trop. Zool., 9: 226.

Diagnosis: Pleurites of second maxillae not fused to the coxosternum; apical claw of second maxillae pectinate on both dorsal and ventral edges. Sterna with pore fields. Last pair of legs with seven podomeres, pretarsus in form of a small pilose tubercle or replaced by a small spine or altogether absent; coxopleura of the last leg-bearing segment each with two internal organs of simple structure ("homogeneous coxal glands" sensu Brölemann & Ribaut, 1912).

Synonymy: We believe that the description of *S. grandidieri* presented below will establish beyond any doubt that this species is congeneric with the type species of *Schendylurus*, *S. australis* Silvestri. The name *Koepckeiella* was withdrawn into *Schendylurus* by its own author (Kraus, 1957), it is here ipso facto placed under *Schendylops* for the first time. The status of *Schendylota varipicta* as only another species of *Schendylurus* was established by Demange & Pereira in 1985; it is automatically now a junior synonym of *Schendylops*. *Nesondyla*, based on the

single species *nealota* Chamberlin, from the Galapagos Islands, was inadequately documented, and remained enigmatic until the type species was redescribed from fresh topotypic material by Shear & Peck (1992: 2267). The information presented by these authors' description and illustrations leaves little doubt that *nealota* is referable to *Schendylops*, possibly an Ecuadorian species introduced into the Galapagos.

Range: Most of Neotropical region including the West Indies; most of Africa; Madagascar. The age of the genus is thus established as antedating the Mesozoic formation of the Atlantic Ocean.

Species: We currently recognize 61 nominal species in this genus.

Schendylops grandidieri (DeSaussure & Zehntner)
Figures 1-33

Schendyla Grandidieri DeSaussure & Zehntner, 1897, in: Grandidier (ed.), Hist. phys. nat. pol. Madagascar, Myr., pl. 12, Figs. 8a-8g; 1902, *idem*, text, p. 332.
Schendylops grandidieri: Cook, 1899, Proc. Ent. Soc. Washington, v. 4, p. 305.
Schendylops grandidieri: Brölemann & Ribaut, 1912, Nouv. Arch. Mus. Hist. Nat. Paris, ser. 5: vol. 4, p. 169, figs. 12-17.

Material: Mus. Hist. Nat. Paris, M. 231, 1 lectoparatype (sex?, last pedal segments missing); Mus. Hist. Nat. Genève, ♂ lectotype, here designated!) all presumably from Sikora, Madagascar, the only locality mentioned in the original description, although the labels state only "Madagascar" in both cases.

Description of lectotype: Adult ♂, body length 23 mm, maximum body width 0.9 mm, with 55 pairs of legs. Color of preserved specimen uniformly pale ochraceus (the original description, referring to freshly preserved specimens, states "... jaune pâle, la tète et les premiers segments ombrès de roussâtre...").

Antennae ca 2.1 times as long as the cephalic sclerite, slightly attenuate distally; articles, excepting 1st and 2nd longer than wide. Setae on articles 1-6 few, either short or long, those of remaining articles progressively shorter and more numerous distally (Figs. 1, 2). Terminal article with ca. 22 claviform setae on the external apical edge, ca. 15 on the internal apical edge, and ca. 4-5 on the apex. Distal end of this antennomere with ca. 6 small unipartite specialized setae proportionately larger than the claviform setae (Fig. 4). Dorsal and ventral surface of articles 2, 5, 9, and 13 with very small specialized setae, which on the ventral side are restricted to an internal latero-apical area where represented by two different types: **a** and **b**. Type **a** setae are very thin and not divided apically, type **b** setae are very similar to those on apex of terminal article, but with two very small apical branches (Fig. 3, **a**, **b**). Each antennomere 2, 5 (Fig. 3), 9, and 13 with one type **a** and one type **b** seta. Specialized setae on dorsal side all are type **b**: article 2 (Fig. 5) with one seta, article 5 (Fig. 6) and 9 (Fig. 7) with two, and article 13 (Fig. 8) with three.

Cephalic sclerite 20% longer than wide, shape and chaetotaxy as in Fig. 9. Clypeal chaetotaxy: 1+1 postantennal setae and 6+7 median setae. Labrum with 21 teeth, those of median labromere more or less round-tipped, laterals with a relatively long and very sharp median extension (Fig. 10).

Dentate lamella of mandible subdivided into two distinct blocks with formula 5, 2 teeth (Fig. 11); pectinate lamella with ca. 15 hyaline teeth.

Coxosternum and telopodites of 1st maxillae with palps. Coxosternum without setae, median projections subtriangular, well developed, provided with 2+2 setae. Distal article of telopodites with 4+4 ventral setae and 8+8 sensory papillae on the dorsal side (Fig. 12).

2nd maxillae with 10+9 setae on coxosternum distributed according to Fig. 12. Apical claw of telopodite well-developed and bipectinate, both dorsal and ventral pectines with ca. 7 teeth (Figs. 13, 14). Chaetotaxy of telopodite as in Fig. 12.

Closed telopodites of prehensors extending forward as far as anterior edge of cephalic sclerite. Basal sclerite with an irregular transverse median row of 8 setae. Telopodites with all articles lacking sclerotized teeth; tarsungulum with a very small tubercle on basal medial edge. Calyx of toxicodene cylindrical (Fig. 17); prehensorial chaetotaxy as shown in Fig. 16.

Legs (last pair excepted) with uniform chaetotaxy (Fig. 18). Each claw ventrobasally with one anterior parunguis and two posterior (Fig. 19).

Sternal pore fields present on 1st to penultimate segments: undivided on segments 1-23 and 51-52(54), medially divided into two subsymmetrical fields on segments 24 to 50 or 51. Sterna 1-23 with a small group of pores on each side of the anterior border of the main pore area. Shape and relative size of fields varying along the trunk as shown in Figs. 20-28. Number of pores/sternum number as follows: 2+17+0/1; 1+42+1/2; 2+71+2/7; 3+71+1/11; 3+68+3/23; 40+29/24; 15+20/50; 33/51; 12/54.

Pretergum of last pedal segment separated from pleurite by a suture on the right side only (Fig. 30). Presternum not divided sagitally; form and chaetotaxy of sternum and tergum as shown in Figs. 29 and 30. Two single ("homogeneous") coxal organs in each coxopleuron (Figs. 29, 30), opening on the membrane between coxopleuron and sternum, covered by the latter. Podomeres of terminal legs incrassate, last podomere smaller than preceeding. Entire ventral surface of podomeres densely invested in short setae; dorsal setae less numerous and larger (Figs. 29, 31). Pretarsus represented only by a very small (almost nonexistant) tubercle with a tiny apical spine (Fig. 33). Intermediate tergum of post-pedal segments with posterior margin convex; intermediate sternum and first genital segment both with convex posterior margin. Gonopods biarticulate, basal article with ca.12 setae and apical with ca. 7 setae (Figs. 29, 32), penis apparently without apical setae dorsally.

Remarks: This specimen is unquestionably mature; it is possible to observe mature spermatozoa inside the body when cleared for study.

Additional species of *Schendylops*

Under the name *Schendylurus*, the species now considered to be referable to this genus have been summarized in three recent papers: species of the northern and Andean Neotropical region (Bolivia, Peru, Ecuador, Venezuela, Colombia, Central America, and the West Indies, by Pereira & Minelli (1993), of Africa by Pereira & Minelli (1995), and of Brazil, Argentina, and Paraguay by Pereira & Minelli (1996), approximately 57 species in all. Replacement of *Schendylurus* with *Schendylops* constitutes automatic and simultaneous **New combination** for all of the species listed in the three papers cited.

In addition, the recent opportunity by L.A.P. to examine type material in the Paris collection and from other sources permits the transfer of still further species into this burgeoning genus, by now the largest in the order Geophilomorpha. It is especially gratifying to establish the presence of four additional species on Madagascar, to reinforce the so-far representation by the type species *grandidieri* only. We provide here a key to the five species now known from that island, to give a treatment equivalent to that already published for the other geographic regions.

Schendylops caledonicus (Attems), new combination

Mesoschendyla caledonica Attems, 1928, Ann. South African Mus., 26: 129, text figs. 35-38, pl. 19, figs. 457-460.
?*Mesoschendyla caledonica*: Lawrence, 1959, Ann. Transvaal Mus., v. 24, p. 364.

The type material of this species has been studied through the kindness of the authorities of the South African Museum, and noted to have **two** coxal organs in each coxopleuron, contrary to the indications of Attems (1928).

Recognition of *caledonica* as a *Schendylops* requires a revision of the key to African species published recently by Pereira & Minelli (1995), as follows:

KEY TO AFRICAN SPECIES OF *SCHENDYLOPS*

1. Pore field series ending on penultimate sternum 2

– At least the last five sterna without pore fields. 4

2. First sternum with pore field. Body length 35 mm. ♂ and ♀ with 53 pairs of legs . . . . . *S. australis* (Silvestri)

– First sternum without pore fields 3

3. Body length 47 mm. ♂ with 63-69, ♀ with 65-71 pairs of legs. Prehensorial tarsungulum with a well developed basal tooth. Last pedal segment without pleurites at the sides of pretergum, posterior border of the sternum not conspicuously "clubbed" medially ..... *S. pumicosus* (Demange)

– Body length 57 mm. ♂ with 83, ♀ with 83-87 pairs of legs. Prehensorial tarsungulum without a well developed basal tooth. Last pedal segment with pleurites at sides of pretergum, posterior border of the sternum conspicuously clubbed medially ..... *S. caledonica* (Attems)

4. Dentate lamella of the mandible not subdivided into blocks. Pore fields present on sterna 2 to 27. ♀♀ with 49 or 51 pairs of legs, ♂ with 47. Body length 20 mm ..... *S. paucidens* (Attems)

– Dentate lamella of mandible subdivided into 2-5 distinct blocks. Pore fields present on sterna 2 to 28-30. ♀♀ with more than 55 pairs of legs; ♂♂ with more than 55 pairs. Body length 30-63 mm 5

5. Body length 30 mm. Labrum with 18-19 teeth. Second maxillae with ca. 20 setae on coxosternum. Last legs with a very small pretarsus. Middle part of clypeus with ca. 11 setae. Prehensorial trochanteroprefemur with a very small tubercle on apical part of the internal border; tarsungulum with well developed basal tooth. ♀ with 69-77, ♂ with 69 pairs of legs ..... *S. polypus* (Attems)

– Body length 60-63 mm. Labrum with more than 20 teeth. Second maxillae with more than 20 coxosternal setae. Pretarsus of last legs with the form of a well developed tubercle. Middle part of clypeus with more than 20 setae. Internal border of prehensorial trochanteroprefemur with an apical tooth, tarsungulum edentate. 6

6. Labrum with ca. 23-30 teeth. Coxosternum of second maxillae with ca.28-33 setae. Prehensorial trochanteroprefemur without tooth or with only a very small one. Pore fields on sterna 2 to 30. Last pedal segment with pleurites at sides of pretergum. Last legs of the ♂ incrassate; last podomere much thinner than the penultimate; pretarsus with 4-6 spines. ♀ with 57-61, ♂ with 57 pairs of legs ..... *S. attemsi* (Verhoeff)

– Labrum with ca. 60 teeth. Coxosternum of second maxillae with ca. 60 setae. Prehensorial trochanteroprefemur with a strong tooth. Pore fields on sterna 2 to 18-21. Last pedal segment without pleurites at sides of pretergum. Last legs of ♂ not incrassate, last podomere nearly as thick as penultimate, pretarsus with 2 spines. ♀ with 65-69, ♂ with 61-69 pairs ..... *S. maroccanus* (Attems)

Schendylops silvicola (Lawrence), new combination

Haploschendyla silvicola Lawrence, 1960, Faune de Madagascar, XII. Myriapodes Chilopodes, p. 13, fig. 1a, d. Type (Mus. Hist. Nat. Paris, M.131) from Ankaratra, Madagascar.

Haploschendyla major Lawrence, 1960, Faune de Madagascar, XII. Myriapodes Chilopodes, p. 15 figs. 1e-g. Type (Mus. Hist. Nat. Paris, M. 128) from Mont d'Ambre, Madagascar. **New synonymy**!

Careful examination of the types of the above names, and three others described by Lawrence in 1960, showed that all were incorrectly placed in *Haploschendyla*, also that the types of the two names cited above are strictly conspecific.

Schendylops paucispina (Lawrence), new combination

Haploschendyla paucispina Lawrence, 1960, Faune de Madagascar. XII. Myriapodes Chilopodes, p.16, figs. 2b-e. Type (Mus. Hist. Nat. Paris, M.130) from Ankaratra, Madagascar.

Schendylops insolita (Lawrence), new combination

Haploschendyla insolita Lawrence, 1960. Faune de Madagascar. XII. Myriapodes Chilopodes, p. 18, figs. 2a, 3a-e, 4e-f. Types (Mus. Hist. Nat. Paris, M. 127) from Moramanga, Madagascar.

Schendylops mascarenica (Lawrence), new combination

Haploschendyla mascarenica Lawrence, 1960. Faune de Madagascar. XII.Myriapodes Chilopodes, p.20, figs. 4a-d.Type (Mus. Hist. Nat. Paris, M.129), from Ambohimahasoa, Madagascar.

KEY TO MADAGASCAR SPECIES OF *SCHENDYLOPS*

1. Ventral pore fields on anterior and posterior sterna. 2

– Pore fields present only on anterior sterna. 4

2. Pore fields ending on antepenultimate sternum; ♀ with 67 pairs of legs . . . . . *S. mascarenica* (Lawrence)

– Pore fields ending on penultimate sternum 3

3. ♂ with 75 pairs of legs; metatarsus of last pair of legs ca 73% length of tarsus ..... *S. insolita* (Lawrence)

– ♂ with 55 pairs of legs; metatarsus of last pair of legs ca 50% length of tarsus ..... *S. grandidieri* (DeSaussure & Zehntner)

4. 51 pairs of legs. Pore fields single (subcircular in form), present from sterna 1 to 19, double on sterna 20 to 22 ..... *S. paucispina* (Lawrence)

– 59-61 pairs of legs. Pore fields single (subtriangular to subovoidal in shape) on sterna 1 to 20-22, fields double from sterna 21-23 to 30-35 .... *S. silvicola* (Lawrence)

2. *Mesoschendyla*

Mesoschendyla Attems, 1909, Denks. Med.-naturw. Gesellsch. Jena, 14: 19. As subgenus of *Schendyla*. Type species: *S.(M.) monopora* Attems, by monotypy.

This relatively small genus, similar to *Schendylops* in most of its characters and obviously related to it, is restricted to southern Africa, Madagascar, and, apparently, Java (an astonishing distribution). Type specimens of several species have been studied and illustrated, and we expect to present a survey of this genus at a later time. For the present, we merely provide a list of the known species in a following section.

3. *Origmadyla*, new genus

Type species: *Schendylops spelaeus* Kraus, 1957.

Name: Neologism formed from the Greek elements *orygmos* (a pit or trench) + *-dyla*, the last syllables in the generic name *Schendyla*.

Diagnosis: Pleurites of second maxillae not fused with the coxosternum; apical claw of second maxillae pectinate on both dorsal and ventral edges. Sterna with pore fields (all double). Some sterna of the anterior region of the body with a deep cylindrical invagination ("oryma") originating from a small concave median cleft on the anterior border. Last pair of legs with seven podomeres; pretarsus apparently fully absent; coxopleura of the last leg-bearing segment each with one internal coxal organ of simple structure ("homogeneous coxal glands" sensu Brölemann & Ribaut, 1912).

Remarks: This genus is very closely related to *Mesoschendyla* Attems, 1909 but differs from it by the presence of a well developed deep cylindrical invagination on some sterna of the anterior region of the body, as well as the consistent division of all sternal pore fields into two areas..

Range: The single included species is so far known only from its type locality in Peru.

Origmadyla spelaea (Kraus), new combination
Figures 34-65

Schendylops spelaeus Kraus, 1957, Senckenb. biol. 38: 364, figs. 14-20. Holotype ♀ (SMF 2920) from Peru: Cueva de las lechuzas, near Tingo Maria, Rio Huallaga, 670 m. asl; Weyrauch leg. 27.VII.1955.

Diagnosis: With the characteristics of the genus, defined above.

Material: Holotype ♀ on seven original slides: (1) head capsule; (2) labrum; (3) mandibles; (4) first and second maxillae; (5) forcipular segment and 1st pedal segment; (6) pedal segments 2 to 53; (7) last 2 pedal segments with postpedal segments.

Description of holotype: Body length 45 mm, body width 1.4 mm, 55 pairs of legs. Color (of preserved specimen in slides): pale ochraceous.

Antennae ca. 2.3 times as long as the cephalic plate, slightly attenuate distally. Setae on articles 1-5 either short or long; those of remaining articles progressively shorter and more numerous towards apical region (Figs. 34-35). Terminal article with ca. 30 claviform setae on the external apical edge, absent on medial edge. Dorsal and ventral surface of articles 2, 5, 9 and 13 with very small specialized setae. On the ventral side these setae are restricted to an internal latero-apical area and are represented by two different types: **a** and **b**. Type **a** setae are very thin and not divided apically, type **b** setae are thicker, hyaline apparently not split apically (**a**, **b**, Fig. 36). Each of articles 2, 5, 9 (Fig. 36) and 13 with 1 type **a** and 1 type **b** seta. Specialized setae on dorsal side are restricted to an apical area and are represented by three different types: **a** and **b** similar to **a** and **b** of the ventral side and type **c** setae are unipartite, much darker (ochraceous in color) and size about 3 times the size of type **b** setae (**a**, **b**, **c**, Fig. 39). Article 2 with 1 type **a** seta and 2 type **b** setae (Fig. 37); article 5 with 1 type **a** , 1 type **b**, and 5 type **c** setae (Fig. 38); article 9 with 1 type **a**, 1 type **b**, and 10 type **c** setae (Fig. 39) and article 13 with 1 type **a**, 1 type **b** and 6 type **c** setae (Fig. 40).

Cephalic sclerite ca. 10 % longer than wide (Fig. 41). Clypeus with chaetotaxy represented by 5+9 median transverse setae and 1+1 prelabral setae (Figs. 42-44). Median labromere with ca. 8 teeth, laterals with ca. 7+6 teeth (Figs. 43-44).

Dentate lamella of mandible divided into three blocks with formula 3-3-3 and 3-3-2 (Figs. 45-46); pectinate lamella with ca. 18 hyaline teeth.

Palps present on both coxosternum and telopodites of first maxillae. Coxosternum with 1+1 setae; median projection of coxosternum subtriangular, well developed, provided with 3+3 setae. Distal article of telopodite with 4+3 ventral setae and 7+8 sensory papillae on the dorsal side (Figs. 47, 49).

Second maxillae with 11+9 setae on coxosternum distributed according to Figure

47. Apical claw of telopodite well developed and bipectinate, dorsal pectine with ca. 22 teeth and ventral with ca. 19 (Fig. 48). Shape and chaetotaxy of telopodite as in Fig. 47.

Closed telopodites of prehensors extending forward as far as anterior edge of cephalic sclerite. Basal sclerite with ca. 20+20 setae dispersed on all surfaces. Telopodites with all articles lacking teeth. Calyx of toxicodene cylindrical (Fig. 51). Chaetotaxy of coxosternum and telopodites as shown in Figure 50.

Legs (last pair excepted) with chaetotaxy uniform throughout the body length and represented by many setae (Figs. 53-56). Each claw ventrobasally with two large subequal parungues, one anterior, one posterior; between these, close to the posterior, a very much smaller third parunguis.

Sterna: first sternum without pores; pore fields begin on sternum 2 and end on penultimate sternum. Fields always double. Shape and relative size changes along the trunk as in Figures 57 through 63. Number of pores/sternum numbers as 22+21/2, 40+40/4, 55+51/7, 53+49/8, 59+48/9, 64+61/11, 5+7/54. Orygmata (see Remarks) present on sterna 8-11 (Figs. 60-62), largest on sterna 8-10; external and internal surfaces of invagination showing polygonal structure. Cleft of anterior border small and concave present on sterna 6 to 13 (Figs. 59-62).

Last pedal segment: pretergum on both sides apparently separated from pleurites by sutures (Fig. 65). Pretergum not divided sagittaly; form and chaetotaxy of sternum and tergum as in Figs. 64-65. Coxopleura slightly protruding on ventro-apical area, chaetotaxy as in Fig. 64. A single homogeneous coxal organ on each coxopleuron. Organs open on membrane between coxopleura and sternum, covered by the latter (Fig. 64). Podomeres of terminal legs moderately incrassate, vestiture of numerous setae ventrally, covering entire segmental surfaces; apex of distalmost podomere apparently without any trace of pretarsus.

Postpedal segments: intermediate tergum with posterior margin convex, intermediate sternum with posterior border slightly concave; first genital sternum with posterior border convex medially, slightly concave laterally. Gonopods uniarticulate (Fig. 64).

Male unknown.

Distribution: PERU: Tingo Maria, Rio Huallaga.

Habitat: This species has been collected inside the cave "Cueva de las lechuzas".

Remarks: The form of some structures in the original preparations is not well preserved, for this reason Figures 64 and 65 do not represent the exact form of the last pedal segment and postpedal segments and Figures 34 and 35 do not show the true proportion width-length of the antennal articles. It is not clear if the sulcus shown on coxosternum of the second maxillae (Fig. 47) is an artifact of the slide or a true characteristic on this species. The setae at the apex of the last antennal article are missing, for this reason we cannot specify the type and number of the specialized setae supposedly present on this part of the antennomere.

GEOGRAPHICAL LIST OF THE SPECIES OF *SCHENDYLOPS, MESOSCHENDYLA,* AND *ORYGMADYLA*

Schendylops (formerly Schendylurus)

Neotropical

1. amazonicus (Pereira et al. 1994)
2. anamariae (Pereira, 1981)
3. andesicola (Chamberlin, 1957)
4. bakeri (Chamberlin, 1914)
5. bolivianus (Silvestri, 1897)
6. borellii Silvestri, 1895
7. brasilianus (Silvestri, 1897)
8. colombianus Chamberlin, 1921
9. continuus Pereira et al. 1995
10.coscaroni Pereira & Minelli, 1996
11.demangei Pereira, 1981
12.demartini Pereira & Minelli, 1996
13.demelloi Verhoeff, 1938
14.dentifer Chamberlin, 1957
15.edentatus Kraus, 1957
16.elegantulus (Meinert, 1886)
17.fieldi (Chamberlin, 1944)
18.gounellei (Brolemann, 1903)
19.gracilis Attems, 1934
20.iguapensis Verhoeff, 1938
21.interfluvius Pereira, 1984
22.integer Chamberlin, 1926
23.januarius Pereira et al, 1994
24.labbanus Chamberlin, 1921
25.lesnei Brolemann & Ribaut 1911
26.lomanus Chamberlin 1957
27.longitarsis (Silvestri, 1895)
28.luederwaldi Brolemann & Ribaut, 1911
29.madariagensis Pereira 1981
30.marchantiariae (Pereira et al 1995)
31.mesopotamicus (Pereira 1981)
32.minutus (Pereria & Minelli, 1993)
33.oligopus (Pereira et al, 1995)
34.olivaceus (Crabill, 1972)
35.pallidus (Kraus, 1955)
36.pampeanus (Pereira & Coscaron, 1976)
37.paolettii (Pereira & Minelli, 1993)
38.paraguayensis (Silvestri, 1895)
39.parahybae (Chamberlin, 1914)
40.paulistus (Brolemann, 1904)

41.perditus (Chamberlin, 1914)
42.peruanus (Turk 1955)
43.placii (Pereira & Minelli, 1996)
44.potosius (Chamberlin, 1956)
45.sublaevis (Meinert, 1870)
46.titicacaensis (Kraus, 1954)
47.tropicus (Brolemann & Ribaut, 1911)
48.varipictus (Chamberlin, 1950)
49.verhoeffi Brolemann & Ribaut, 1911
50.virgingordae Crabill, 1960

African

51. attemsi Verhoeff, 1900
52. australis Silvestri, 1907
53.caledonicus (Attems, 1928)
54.maroccanus (Attems, 1903)
55.paucidens Attems, 1939
56.polypus Attems, 1928
57.pumicosus Demange, 1963

Malagasy

58.grandidieri DeS. & Zehntner, 1902
59.insolitus Lawrence, 1960
60.mascarenicus Lawrence, 1960
61.paucispinus Lawrence, 1960
62.silvicola Lawrence, 1960

Mesoschendyla

African

1.cribrifera Verhoeff 1937
2.franzi Dobroruka 1960
3.monopora Attems, 1909
4.picturata Lawrence, 1966
5.rossi Crabill, 1968
6.weberi Verhoeff, 1940

Malagasy

7.leachi Crabill, 1968

Indonesian

8.javanica Attems, 1907

Orygmadyla

I.spelaea (Kraus, 1957) (Peru)

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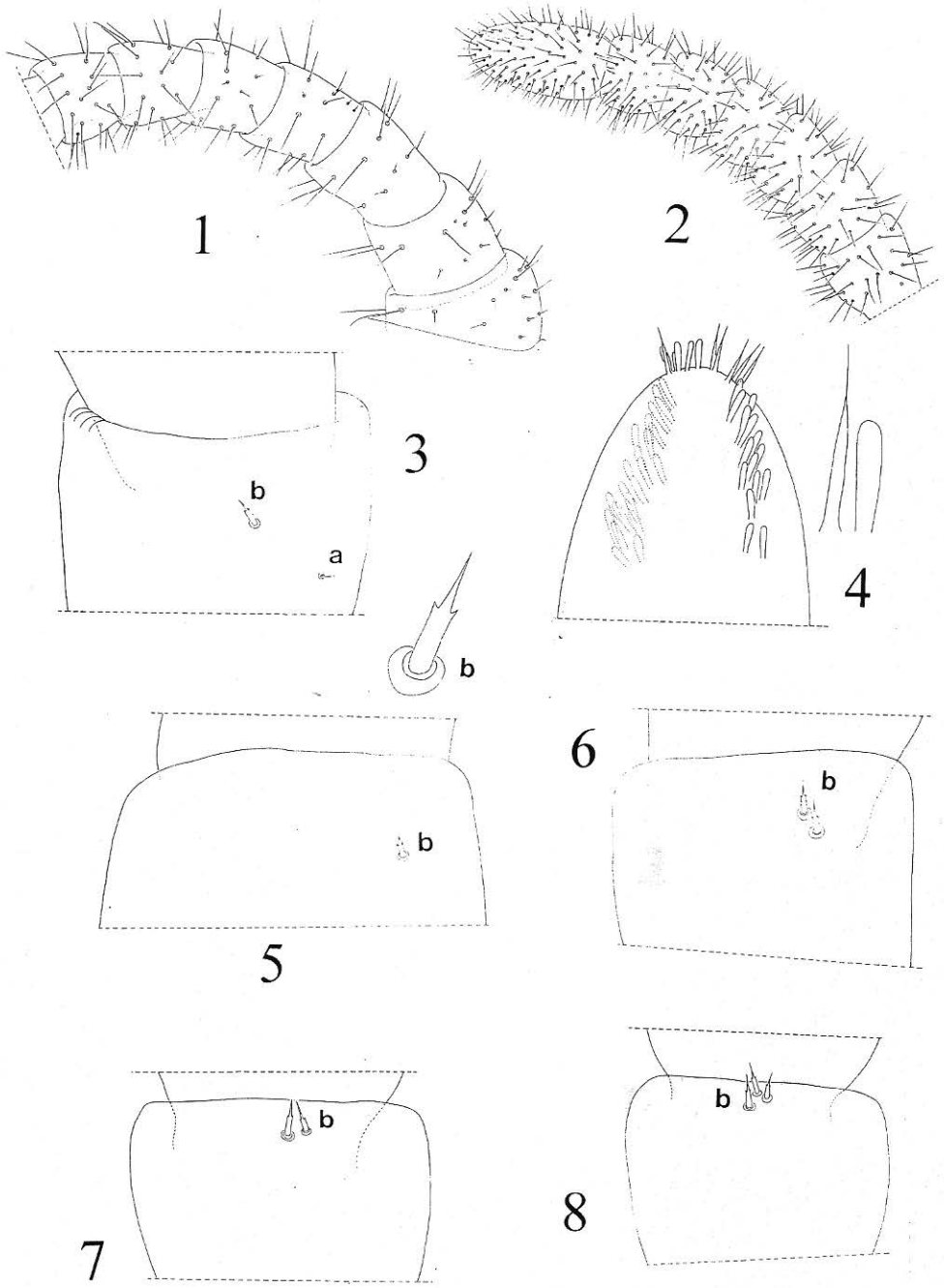
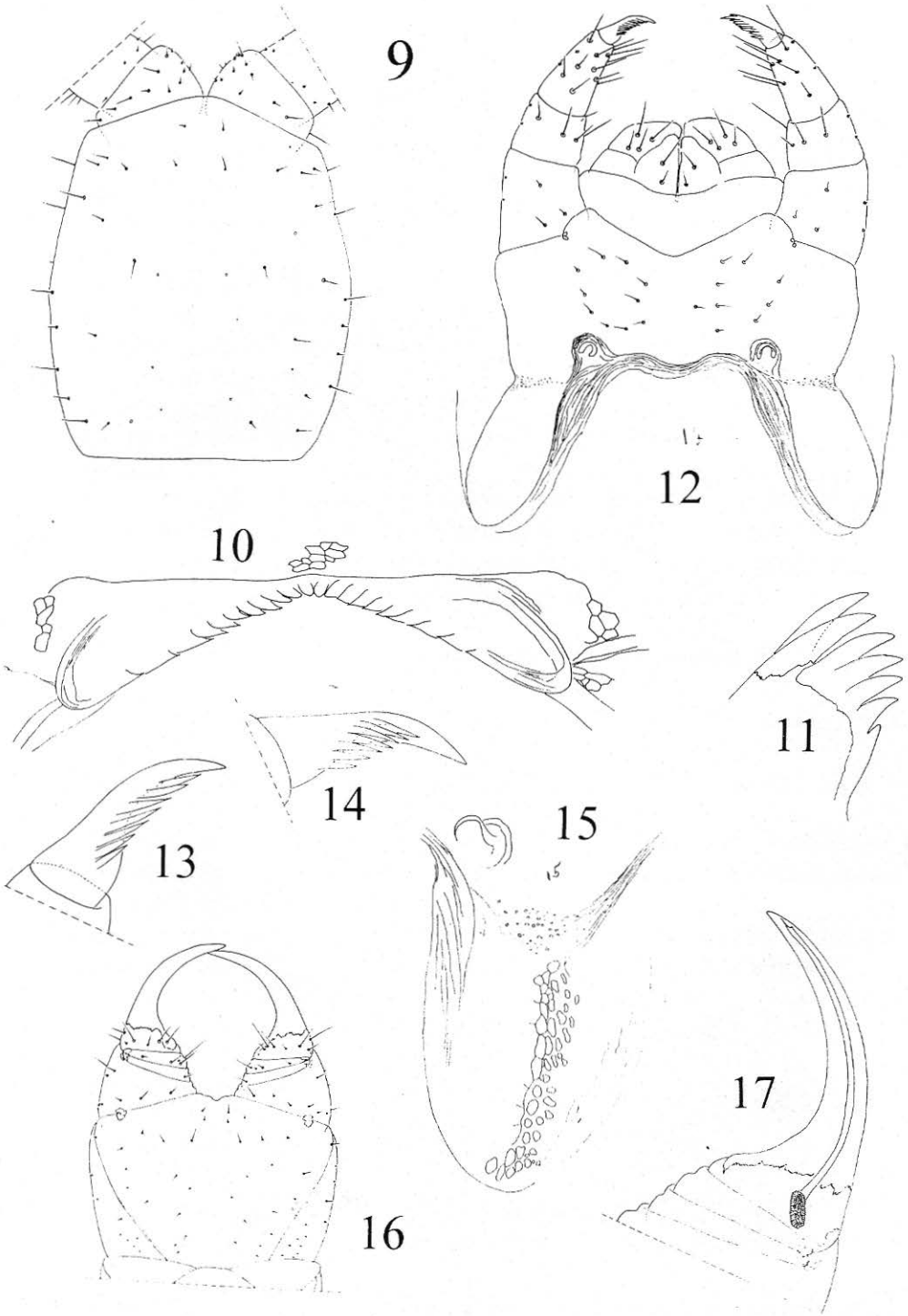
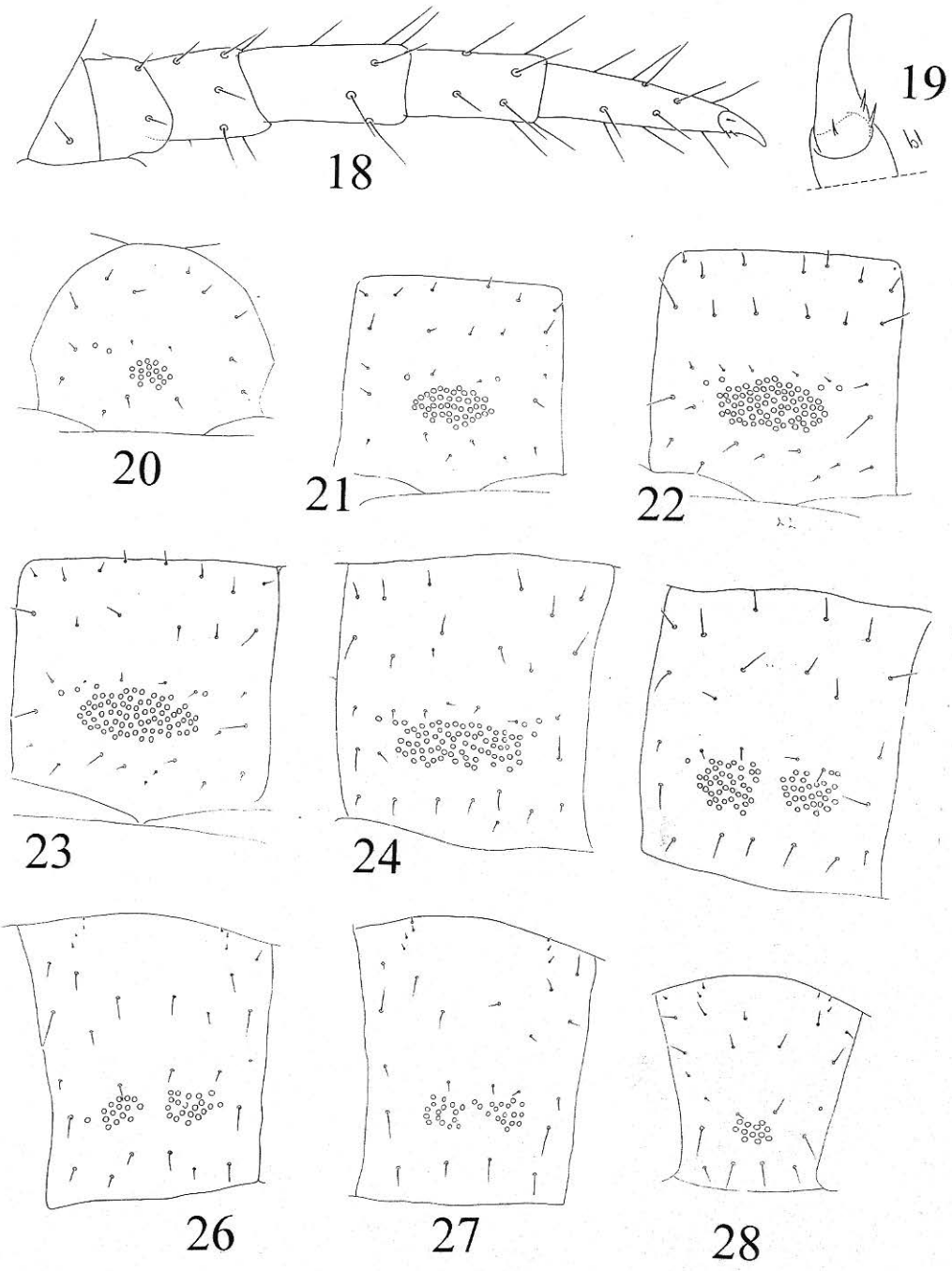


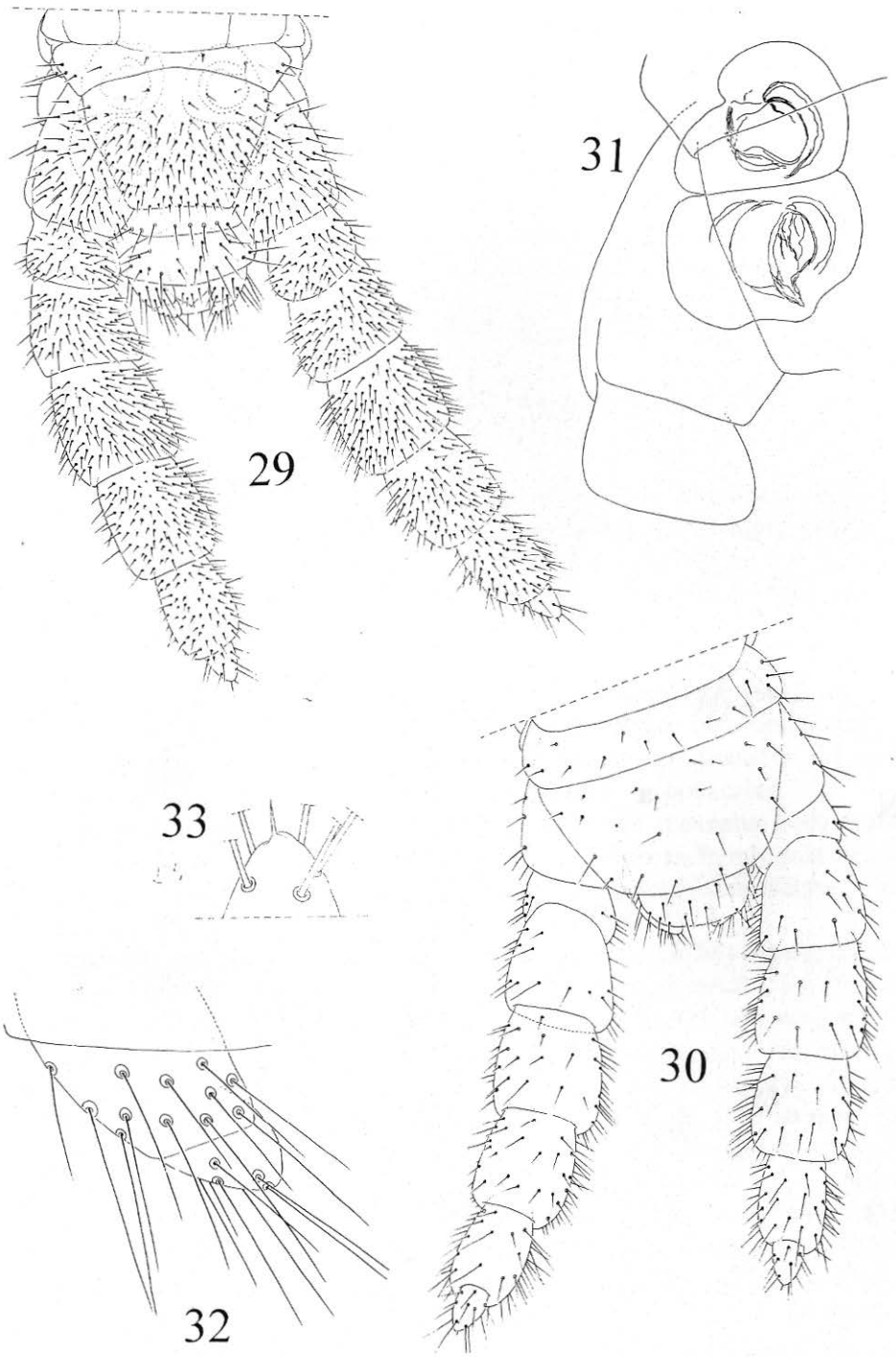
Figs. 1-8. *Schendylops grandidieri* (DeSaussure & Zehntner). ♀ lectotype. 1: 1st-7th antennomeres, ventral view; 2: 8th-14th antennomeres, ventral view view; 3: 5th antennomere, ventral view, showing specialized setae **a** and **b**, (**b** enlarged at lower right); 4: distal end of terminal antennomere; 5: 2nd antennomere, dorsal side; 6: 5th antennomere, dorsal side; 7: 9th antennomere, dorsal side; 8: 13th antennomere, dorsal side.



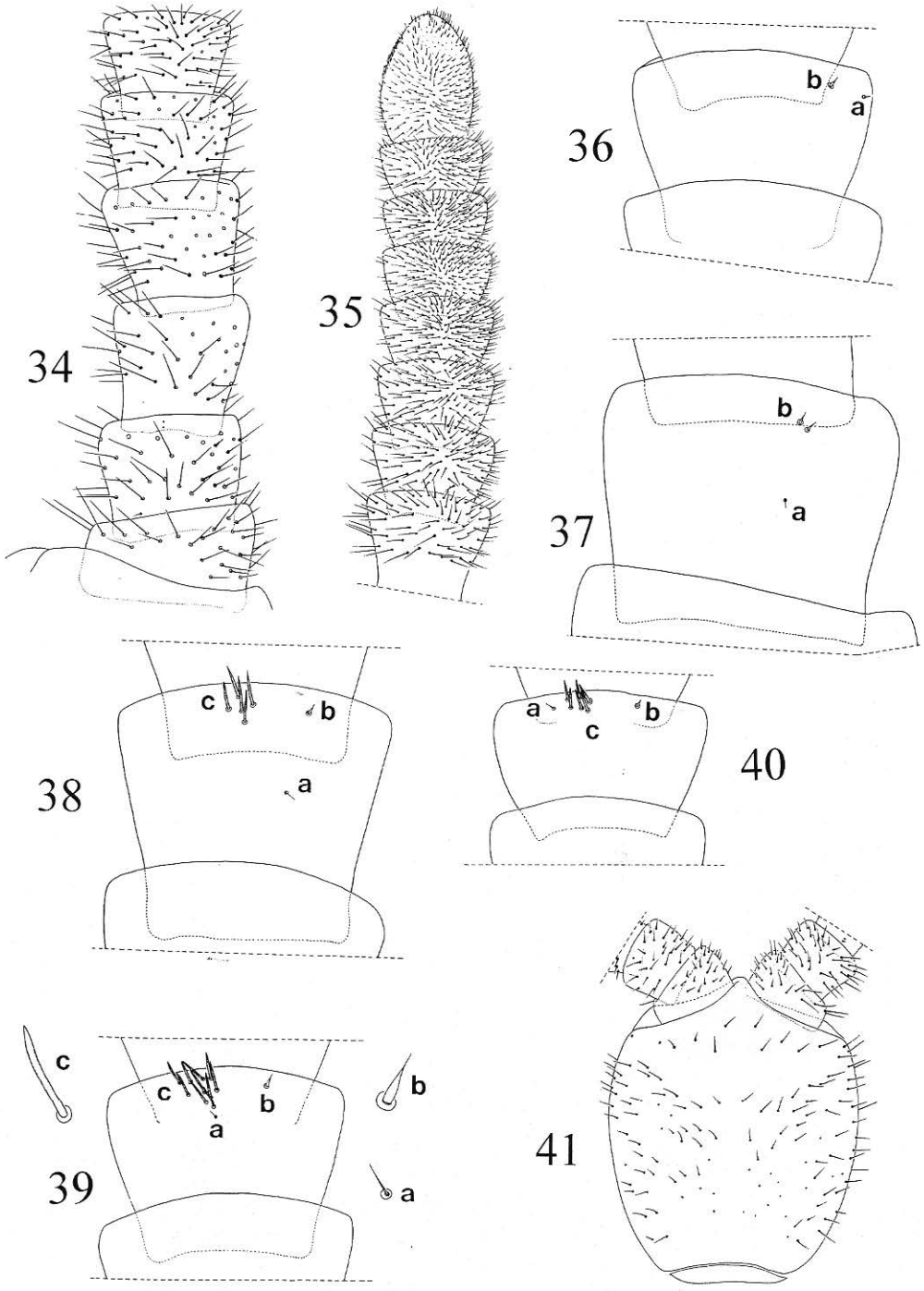
Figs. 9-17. *Schendylops grandidieri* (DeSaussure & Zehntner), lectotype ♀. 9: cephalic sclerite, dorsal view showing chaetotaxy and antennal bases; 10: labrum; 11: left dentate lamella; 12: 1st and 2nd maxillae, ventral view; 13: apical claw of 2nd maxillae, dorsal view; 14, the same, ventral view; 15: coxopleural region of 2nd maxillae, right side enlarged; 16: prehensors, ventral aspect; 17: right prehensorial telopodite, showing calyx.



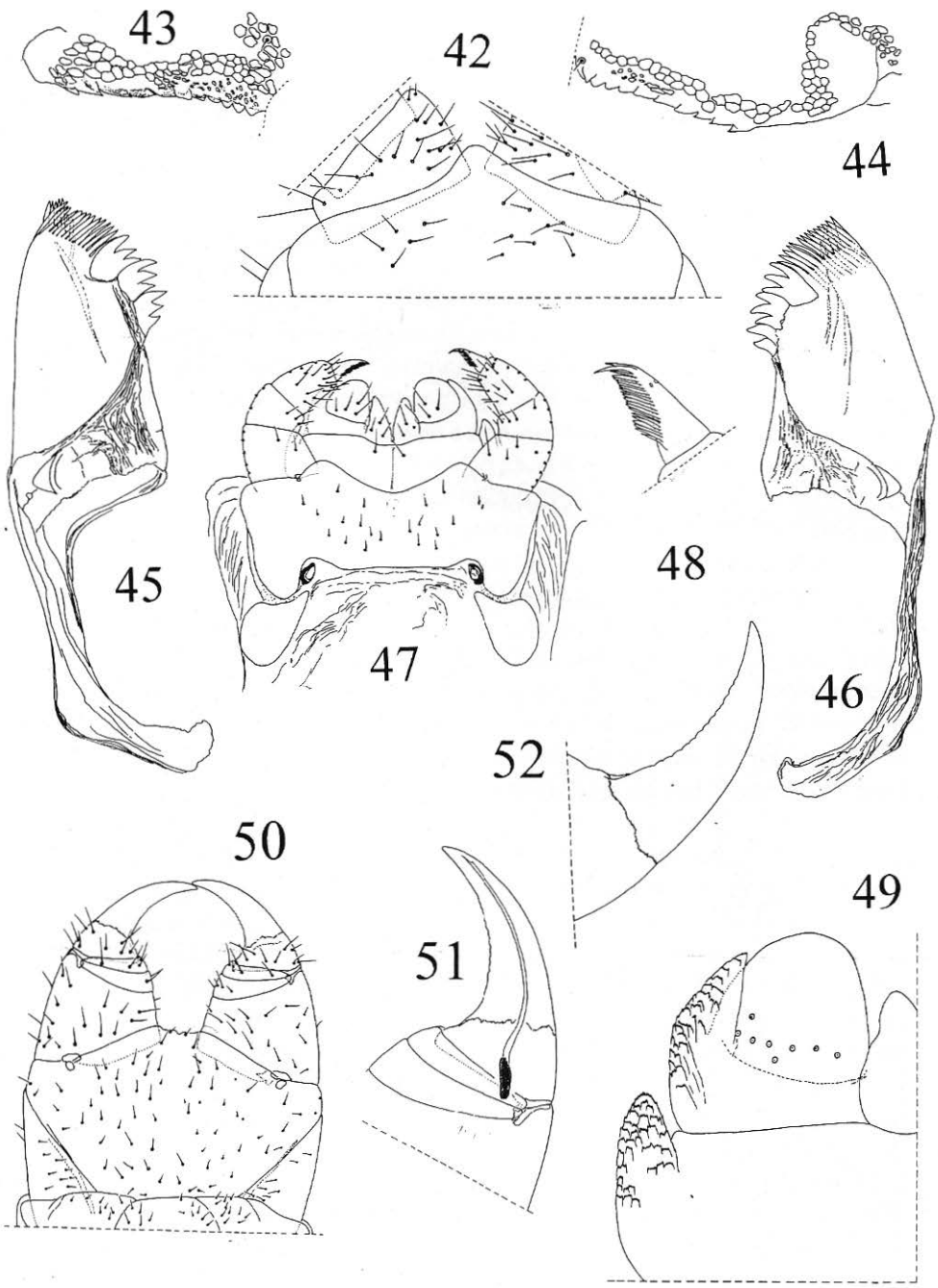
Figs. 18-28. *Schendylops grandidieri* (DeSaussure & Zehntner). ♀ lectotype. 18: leg from midbody segment, showing chaetotaxy; 19: tarsal claw (enlarged showing minute parngues); 20-28, sterna of segments 1, 2, 7, 11, 23, 24, 50, 51, and 54, respectively, showing arrangement of ventral pore fields.



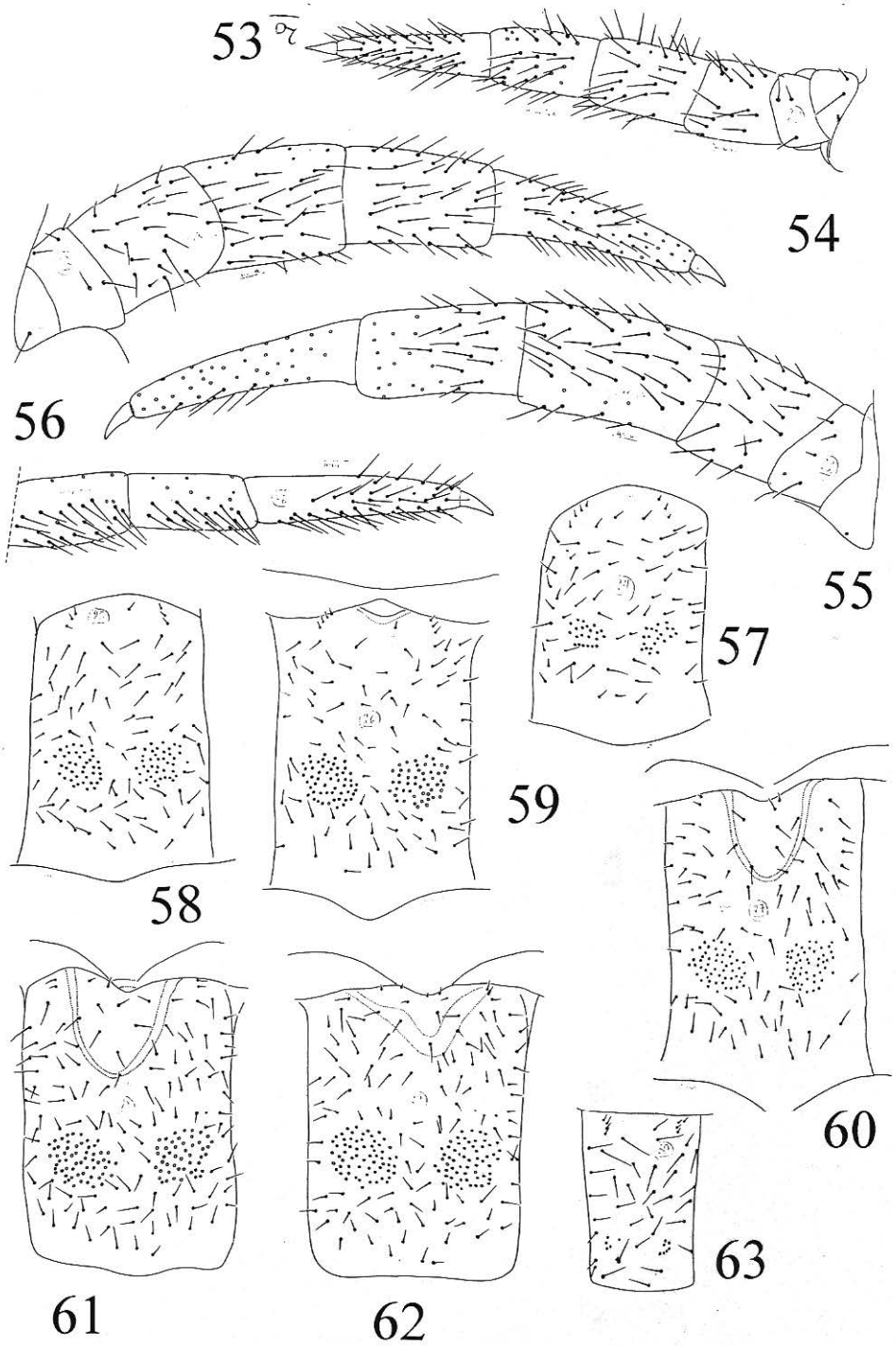
Figs. 29-33. *Schendylops grandidieri* (DeSaussure & Zehntner). ♀ lectotype. 29: posteriormost segments, ventral view; 30: posterior segments, dorsal view; 31: right coxopleuron and segment of last pedal segment, ventral view, showing the two separate coxal organs; 32: right gonopod, dorsal view; 33: apical (7th) podomere of terminal leg, enlarged.



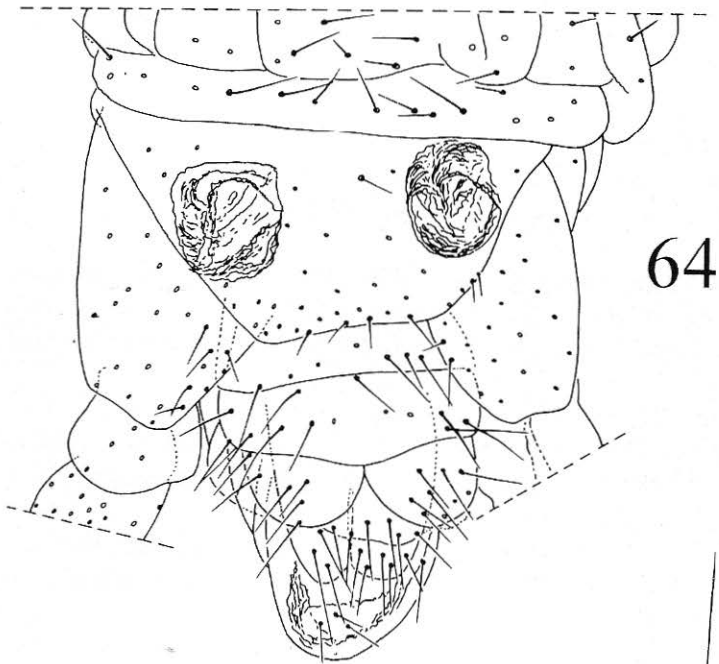
Figs. 34-41. *Orygmadyla spelaea* (Kraus), ♀ holotype. 34: right 1st-6th antennomeres, ventral view; 35: right 7th-14th antennomeres, ventral view; 36: right 9th antennomere, ventral view; 37: right 2nd antennomere, dorsal view; 38: right 5th antennomere, dorsal view; 39 right 9th antennomere, dorsal view; 40: right 13th antennomere, dorsal view; 41: cephalic sclerite.

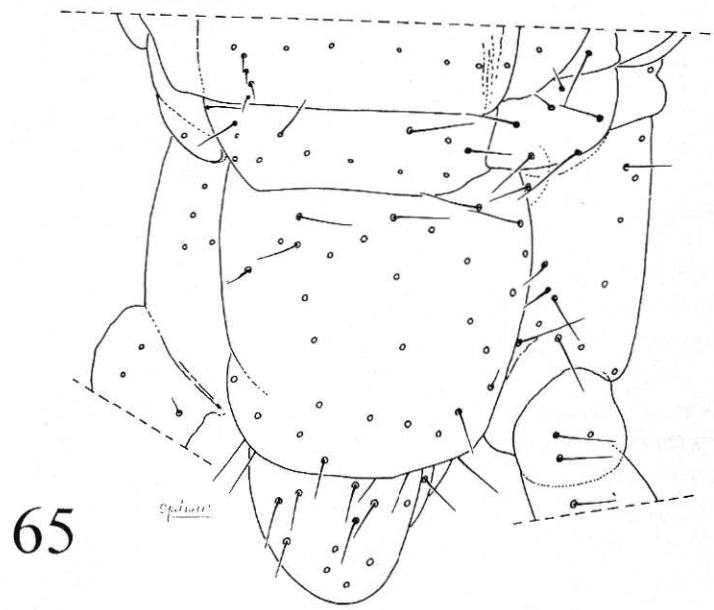


Figs. 42-52. *Orygmadyla spelaea* (Kraus), ♀ holotype. 42: clypeus and basal antennomeres; 43: right half of labrum; 44: left half of labrum; 45-46, mandibles; 47: 1st and 2nd maxillae; 48: apical claw of 2nd maxillary telopodite; 49: left 1st maxilla, ventral vew; 50: prehensorial segment, ventral view; 51: apex of left prehensorial telopodite, ventral view; 52: detail of distal part of left prehensor, ventral view.



Figs. 53-63. *Orygmadyla spelaea* (Kraus), ♀ holotype. 53: right 1st leg, ventral view; 54: right 10th leg, ventral view; 55: right 22nd leg, ventral view; 56: distal articles of right 54th leg, ventral view; 57-63: sterna 2, 4, 7, 8, 9, 11 and 54 respectively.





Figs. 64-65. *Orygmadyla spelaea* (Kraus), ♀ holotype. 64: last pedal segment and postpedal segments, ventral view; 65: the same, dorsal view.

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