

THE MILLIPED FAMILY RHISCOSOMIDIDAE
(DIPLOPODA: CHORDEUMIDA: STRIARIOIDEA)*

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Silvestri (1909) established the Family Rhiscosomididae for the single species *Rhiscosomides mineri*, from Oregon. Aside from the description of a second Oregon species by Chamberlin (*R. josephi*) from a female (Chamberlin, 1941), nothing further had been learned about the relationships or ecology of the millipeds of the family until my general review (Shear, 1972) of the North American families of the Order Chordeumida. In that paper, I described a third species, *R. acovescor*, from California, transferred *Tingupa monterea* Chamberlin to *Rhiscosomides*, and established the relationship of the Family Rhiscosomididae to the Families Caseyidae, Urochordeumidae and Striariidae. Together, these four families make up the Superfamily Striarioidea.

Beginning in late 1971, I received nearly 600 unsorted Berlese samples from Ellen M. Benedict, of the Department of Biology, Portland State University, Portland, Oregon, and about 50 similar samples from Dr. David Malcolm, Pacific University, Forest Grove, Oregon. These samples were taken pursuant to studies of pseudoscorpions, but also contained a large number of millipeds. The millipeds from this material add enormously to our knowledge of the fauna of the northern Pacific coast of the United States, and I am extremely grateful to Mrs. Benedict and Dr. Malcolm for allowing me to examine them. This paper represents the first report based largely on the Oregon Berlese material, which now allows a more or less comprehensive revision of several little-known milliped families. I am also grateful to Dr. Paul Arnaud, California Academy of Sciences, San Francisco, California, for allowing me to borrow that institution's collection of unidentified millipeds.

However, despite the rich material now available, a number of questions remain to be answered concerning the rhiscosomidids. (1) Chamberlin's species *R. monterium*, the southernmost known representative of the genus, remains unstudied, since the types (the only known material) are no longer in existence. It appears to be a species distinct from *R. acovescor*, of Marin County. (2) The re-

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lationship of the rhiscosomidids to the striariids is even more obvious than before. I think that when the striariids from the Benedict and Malcolm collections are thoroughly studied, it might prove desirable to even consider the Rhiscosomididae a subfamily of the Striariidae, despite the numerous differences in gross body form. (3) More material from California is needed, as there are probably several additional species occurring there. (4) Rhiscosomidids have not been collected in the state of Washington, where they may also occur, though numbers of Berlese samples from suitable habitats in that state contained no rhiscosomidids. The southern coastal region of Washington needs further exploration for millipeds.

Ecologically, there do not appear to be any really significant differences in the habitats of the several known species. All have been collected most frequently from rotted wood, from conifer duff, and less frequently from deciduous duff and litter. Collections where elevational data is available are from 1100 ft. elevation or less. Nearly all were taken between November and March. However, the holotypes of *R. montereum* and *R. trinitarium* were collected in June and July respectively, and the latter was taken above 3400 ft. elevation. It should be emphasized that this data represents negative evidence from many samples from suitable habitats taken by Mrs. Benedict at much higher elevations and at other times of the year. Summer and early fall samples were poor in all types of millipeds; perhaps we are dealing here with a fauna adapted to low to moderate temperatures and high humidity, individuals of which burrow deeper into the soil during unfavorable seasons.

All type material for new species described below has been deposited in the Museum of Comparative Zoology, Cambridge, Massachusetts, except for the holotype of *R. trinitarium*, which is the property of the California Academy of Sciences, San Francisco, California.

Family *Rhiscosomididae* Silvestri

Rhiscosomididae Silvestri, 1909, Rend. R. Accad. Lincei 18: 232; 1913, Boll. Lab. Zool. Portici 7: 307; Shear, 1972, Bull. Mus. Comp. Zool. 144(4): 261.

Type Genus: Rhiscosomides Silvestri, 1909. The family is monobasic.

Diagnosis: Distinct from species of Caseyidae in having broad segmental paranota, from species of Urochordeumidae in having the collum wider than the head, and from species of Striariidae in the

body ornamentation (Fig. 4): tiny, sharp, seta-tipped tubercles, rather than longitudinal ridges. *Rhiscosomidids* also resemble somewhat the larger species of the genus *Tingupa* (Tingupidae), but may be distinguished from them by the body ornamentation as well; tingupids are covered with short, longitudinal carinae.

Description: Small, striarioid millipeds (Fig. 4) with 30 post-cephalic segments. Collum broader than head, only slightly reflexed ventrad laterally. Antennae clavate, short. Mentum of gnathochilarium divided. Postcollum segments with strong paranota extending laterad, posterior lateral corners becoming strongly reflexed posteriad, segmental setae long, rather blunt. Surfaces of metazonites covered with closely set, sharply pointed tubercles bearing tiny branched setae. Sixth segment of males enlarged in some species. Epiproct trilobed. Legs normal, pregonopodal legs of males somewhat more crassate than postgonopodal legs. Gonopods of males (Figs. 2, 7, 10, 18) with sternum strongly sclerotized, two prominent groups of coxal processes. Anterior coxal processes partially fused in some species to form anterior plate. Posterior coxal processes usually furnished with fimbriate, membranous, or flagelliform branches and areas. Telopodites irregular, lobelike. Ninth legs reduced in size, with blunt coxal process, flattened, granular telopodite of one segment (Figs. 9, 14, 16). Coxae of legs 10 with glands opening on anterior faces. Legs 11 normal. Cyphopods embraced by expansions of sternites and coxae of second and third legs, with postgenital structures of uncertain origin (Fig. 3).

Distribution: Pacific coast region of the United States from the Monterey Peninsula north to the Columbia River, usually at elevations below 1100 ft.

Genus *Rhiscosomides* Silvestri

Rhiscosomides Silvestri, 1909, Rend. R. Accad. Lincei 18: 232; 1919, Bull. Lab. Zool. Portici 7: 308; Shear, 1972, Bull. Mus. Comp Zool. 144(4): 261.

Type Species: *Rhiscosomides mineri* Silvestri, by monotypy.

Description: The genus and family are coextensive, but the following additional characters may be noted. Body generally dark brown in color, collum usually cream-white, bases of segmental setae marked with light spots. In species in which sixth segment of males is enlarged, that segment lighter in color dorsally than the others. General appearance is of parallel-sided polydesmiform animals, squared off anteriorly at collum, tapering abruptly to blunt epiproct from segment 25. Ocelli vary in number from 5 to 7, variable within species.

Gonopod Anatomy of *Rhiscosomides* Species

The gonopods of *Rhiscosomides* species males conform well to the striarioid pattern. The sternum (Fig. 2, *S*) is heavily sclerotized and anteriorly margined, with deeply depressed openings from the tracheal spiracles. Laterally, the sternum is broadly expanded, concealing the bases of the coxal processes. The anterior coxal processes (Fig. 1, *AC*) are closely appressed, and in the *Acovescor* Group of species are wholly or partially fused to form a broad plate. A strong lateral branch is usually present (Fig. 2, *LB*), but may be a broad flange (Fig. 7), or the largest part of the process (Fig. 18). The length of the anterior coxal process and the form of its terminal branches are of excellent taxonomic and diagnostic value. The posterior coxal process usually has three branches: the anterior branch (Fig. 7, *AB*), the mesal branch (Fig. 7, *MB*), usually the largest, and the generally much smaller posterior branch (Fig. 7, *PB*). The mesal and posterior branches are usually connected by a membranous or fimbriate area. There is also a flabelliform median structure arising from the heavily sclerotized part of the sternum that extends between the gonopods. This sternal flap (Fig. 10, *SF*) usually comes off with one or the other of the gonopods when they are separated. The telopodites (Figs. 2, 10, *T*) are amorphous, lobelike structures that are usually displaced laterally, but may interlock basally with the lateral extensions of the sternum or of the anterior coxal processes. They are of little taxonomic value. The posterior gonopods are rather uniform throughout the genus (Figs. 9, 14, 16). In my 1972 description, I erred in calling the narrow anterior mesal coxal lobe the telopodite. The actual telopodite is flattened and irregular in outline and bears a more or less pointed process on the posteriomesal margin, which extends posteriad. This telopodite process and the coxal lobe protect and partially support the anterior gonopods, and in some animals, clasp between them the coxae of legs 10.

In terms of gonopod anatomy and a few other characters, the six species known from males fall into two groups. In the *Acovescor* Group (*R. acovescor*, *R. trinitarium*), the anterior coxal processes tend to be fused or broadly contiguous mesally, and are rather short. Areas of highly branched, fine cuticular fibers are well developed on the posterior coxal processes. The sixth segment of the males is only slightly or not at all enlarged; in *R. acovescor* the collum is colored like the other segments, instead of being white. Females have not been collected. Both species occur in California, and *R. monterium* will probably also prove to belong to the group.

The Miner Group includes *R. mineri*, *R. josephi*, *R. malcolmi* and *R. benedictae*. In these species, the anterior coxal processes are usually more rodlike, not at all fused mesally, and are more or less sharply curved anteriad. The fimbriate or membranous areas on the posterior coxal processes are of limited extent, and there is an area on the mesal branch that appears to be glandular. The sixth segment of males is enlarged; the collum is white. Females have postgenital bodies (Fig. 3) of uncertain origin immediately posterior to the cyphopods. These are of limited utility in diagnosis, though they cannot be used to separate some species. The four species occur along the Oregon coast and in the foothills of the Coast Ranges.

Certainly, by the standards that have been applied in the past, these two species groups might have been recognized as genera, and I suggested (Shear, 1972) that *R. acovescor* might not be congeneric with *R. mineri*. However, *R. mineri*, the type species of *Rhiscosomides*, shows a degree of intermediacy in the form of the anterior coxal processes, particularly when compared to *R. trinitarium*, which, in turn, is intermediate between *R. mineri* and *R. acovescor*. In the light of these facts, and because of the small number of species in the family, it seems pointless to recognize a second genus at this time.

Key to Species of *Rhiscosomides*
(excluding *R. montereum*)

- 1a. Sixth segment of males conspicuously enlarged (Fig. 4), lighter in color than other segments; anterior coxal processes of gonopods usually rather rodlike (Figs. 7, 10, 15), touching mesally but not fused. 3
- 1b. Sixth segment of males not much larger, if at all, than other segments; anterior coxal processes of gonopods somewhat flattened to platelike, more or less contiguous mesally, or fused. 2
- 2a. Anterior coxal processes without lateral branches, fused into a broad plate (Fig. 17); Marin Co., Calif. *acovescor*
- 2b. Anterior coxal processes with elaborate branches; Trinity Co., Calif. *trinitarium*
- 3a. Apical teeth or processes of anterior coxal process small, not directed posteriad (Figs. 7, 10, 15). 4
- 3b. Anterior coxal process with large apical branch directed ventro-posteriad (Fig. 2) *mineri*
- 4a. Anterior coxal processes bent sharply anteriad at nearly a right angle (Figs. 7, 15) 5
- 4b. Anterior coxal processes long, rodlike, evenly curved (Fig. 10) *benedictae*

- 5a. Anterior branch of posterior coxal process broad, bladeliike (Fig. 15) *malcolmi*
 5b. Anterior branch of posterior coxal process narrow, more rod-like (Fig. 7) *josephi*

Rhiscosomides montereum (Chamberlin)

Tingupa montereum Chamberlin, 1910, Ann. Ent. Soc. Amer. 3: 240-241, figs. 3-5, sex not specified.

Rhiscosomides montereum, Shear, 1972, Bull. Mus. Comp. Zool. 144(4): 262.

Type: Holotype of unspecified sex from Pacific Grove, California, collected June, 1902, lost, presumed destroyed.

Notes: Little more can be said about this form until males are discovered, but as I earlier pointed out (Shear, 1972), the detailed description of the nonsexual characters leaves no doubt that this species belongs to *Rhiscosomides* and not to *Tingupa*. There are eight ocelli. An immature *Rhiscosomides* female from San Mateo County, California, also has eight ocelli, and may be an example of *R. montereum*.

The change in spelling of the specific epithet, which I did not observe in my 1972 report, is made necessary by the gender of the generic name.

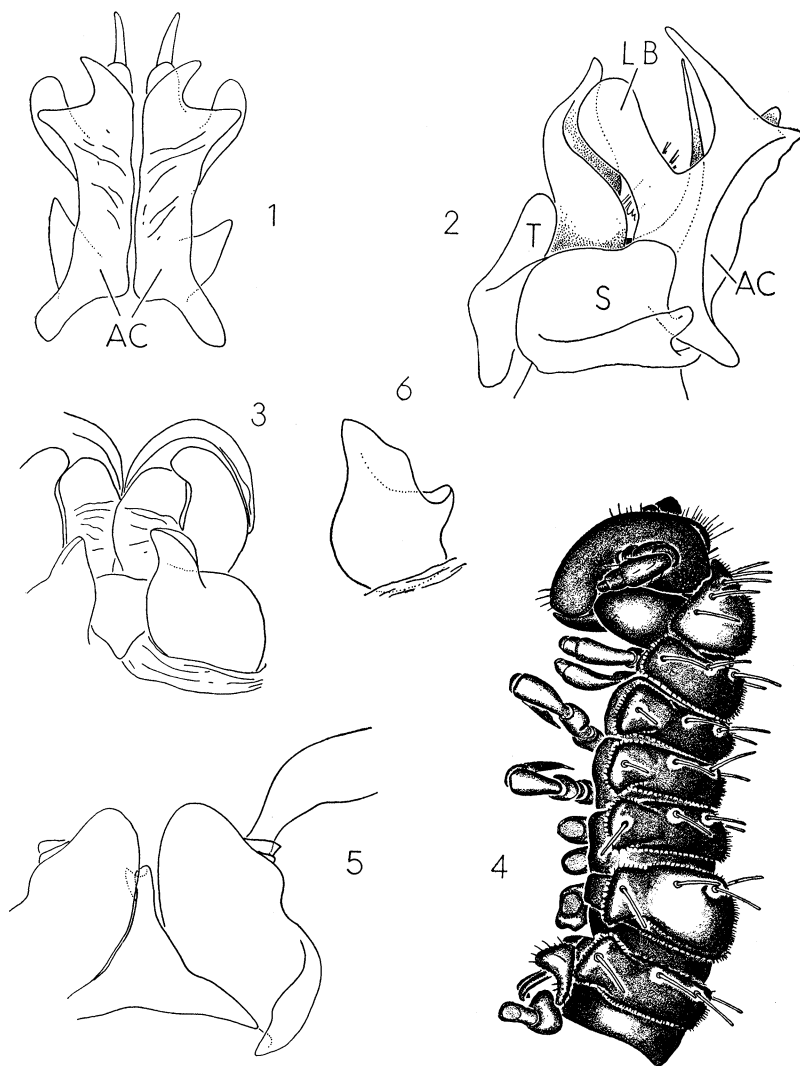
Rhiscosomides mineri Silvestri

Figs. 1-3

Rhiscosomides mineri Silvestri, 1913, Boll. Lab. Zool. Portici 7: 308-310, figs. 4-7, ♂; Shear, 1972, Bull. Mus. Comp. Zool. 141(4): 261-262.

Type: Male holotype from a rotting log, Lebanon, Linn Co., Oregon; whereabouts of specimen unknown, not examined. Silvestri's excellent figures (Silvestri, 1913) leave no doubt about the identity of this species.

Description: Male from 5 mi east of Yamhill, Yamhill Co., Oregon; length, 7.1 mm, width, 1.12 mm. Body of typical form, head broad, front somewhat flattened, depressed in anterior midline, suprantennal swellings moderate. Antennae short, strongly clavate, reflexed along sides of head, reaching anterior margin of segment 4 when fully extended. Ocelli seven, in two rows of three and four. Collum broader than head, lateral margins only a little deflexed ventrad, posteriolateral corners rounded, curved anteriorly, anterior margin sinuous, posterior margin arcuate. Segments with rather narrow, polydesmiform paranota at first curved forward, posteriolateral corners becoming acute, reflexed posteriorly, anterior and pos-



Figs. 1-3. *Rhiscosomides mineri*. Fig. 1. Anterior coxal processes of anterior gonopods, anterior view. Fig. 2. Right anterior gonopod, lateral view. Fig. 3. Cyphopods, posterior view. Figs. 4-6. *R. josephi*. Fig. 4. Body of male, lateral view of anterior end. Fig. 5. Sternum and coxae of legs 2 of female, posterior view. Fig. 6. Left postgenital structure of female, posterior view.

terior margins of paranota evenly curved. Prozonites of segments with small, rounded granules becoming larger, acute on metazonites, bearing minute branched setae. Segmental setae along anterior margin of metazonite, outermost at midpoint in lateral margins of paranota. Epiproct trilobed. Legs short, femora clavate.

Legs 7 with coxae somewhat enlarged. Anterior gonopods (Figs. 1, 2) typical. Anterior coxal processes closely appressed in midline (Fig. 1), with large posteriorly directed apical branch (Fig. 2), blunt, spatulate lateral branch embracing posterior coxal process. Anterior branch of posterior coxal process long, acute, curved, sword-like; mesal branch nearly sigmoid, conforming to lateral branch of anterior coxal process; posterior branch apparently absent. Telopodite lobelike. Posterior gonopod (ninth leg) typical, flattened, setose. Coxae of legs 10 enlarged, gland opening on anterior face. Other postgonopodal legs normal.

Coloration: dark brown, prozonites and metazonites of sixth segment lighter tan, collum cream-white, legs and venter white. Bases of segmental setae marked by light spots.

Female from same locality: Size and body form much as in male, but sixth segment of normal size. Ocelli of 3 females: 2 specimens have 5 ocelli, one has 6. Cyphopods and postgenital structures as in Fig. 3.

Distribution: OREGON: *Yamhill Co.*, 5 mi east of Yamhill on Hwy 240, Berlese of litter and grass, 2 October 1971, E. Benedict, ♂ ♀ ♀; *Washington Co.*, 2 mi north of Helvetia on Bishop Road, Berlese of mixed conifer and deciduous duff, 21 January 1968, D. Malcolm, ♀; *Tillamook Co.*, 4 mi south of Blaine, elev. 500', Berlese of rotten wood, 15 March 1972, E. Benedict, ♀.

Rhiscosomides josephi Chamberlin

Figs. 4-9

Rhiscosomides josephi Chamberlin, 1941, Bull. Univ. Utah Biol. Ser. 6: 16-17, no figs.; Shear, 1972, Bull. Mus. Comp. Zool. 141 (4): 262.

Type: Female holotype from "John Day Creek," Douglas Co., Oregon, collected 18 November 1941, by J. C. Chamberlin; specimen in Chamberlin Collection, now at U. S. National Museum. There is no "John Day Creek" in Douglas Co., but there is a town of Day Creek, and a small stream of that name flowing into the South Umpqua River. It is presumed that this is the type locality, and not the region of the John Day River to the northeast, semiarid country from which few millipeds have been collected. All subse-

quent collections of *R. josephi* are from the Douglas Co. region. Admittedly, the assignment of this species name is somewhat arbitrary, but no harm is done by using it for the commonest species of southwestern Oregon.

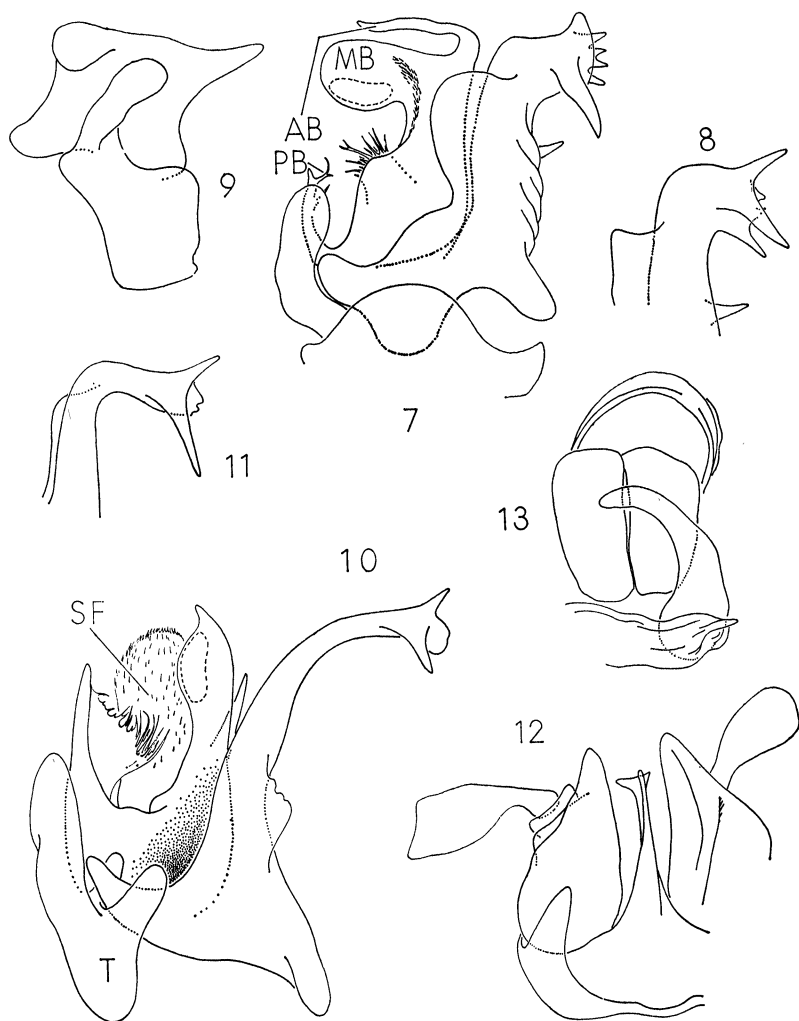
Description: Male from Canyonville County Park, Douglas Co., Oregon; length, 7.0 mm, width, 1.10 mm. Body of typical form, nonsexual characters as described for *R. mineri*.

Anterior gonopods (Figs. 7, 8): anterior coxal processes short, sharply curved anteriad, termination complex, somewhat variable (compare Figs. 7 and 8), usually with large lateral tooth, smaller mesal teeth, small anterior tooth; lateral branch of process a broad flange embracing posterior coxal processes. Posterior coxal processes with anterior and mesal branches bent sharply posteriad at right angles, posterior branch much reduced. Telopodites typical. Ninth legs (posterior gonopods) typical of genus (Fig. 9). Coloration as usual.

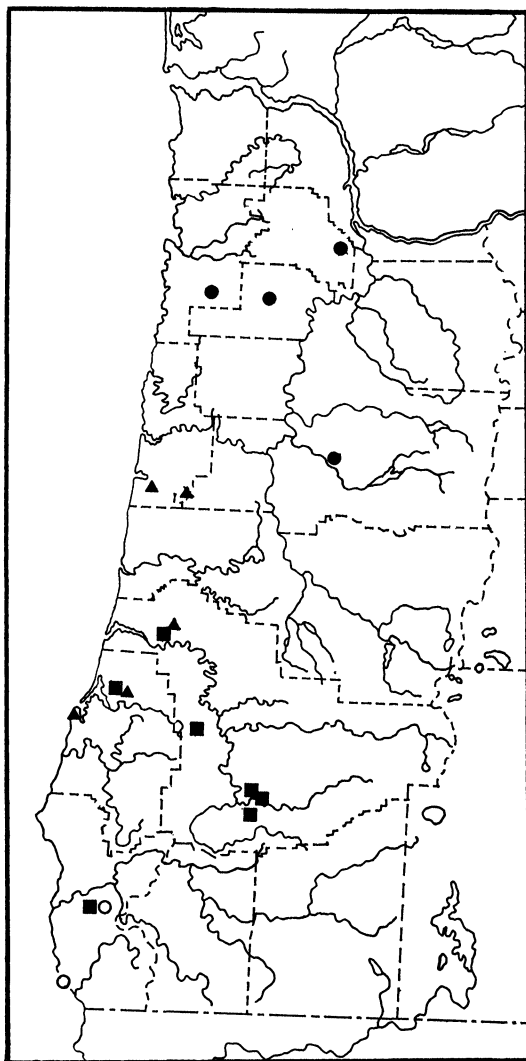
Female from same locality; size and structure much as in male, sixth segment not enlarged. Sternite of second legs with blunt extension between coxae (Fig. 5), postgenital structure similar to that of *R. mineri* (Fig. 6).

Distribution: OREGON: *Coos Co.*, 8 mi east, 2 mi south of Allegany, Weyerhaeuser Co. Millicoma Tree Farm, company road 5000, Berlese of *Pseudotsuga* bark flakes on clear-cut slope, 20 November 1971, E. M. Benedict, ♀; *Curry Co.*, 13 mi east of Gold Beach on road to Agness, elev. 600', Berlese of tan oak duff, 10 March 1972, E. M. Benedict, ♂ ♀ ♀; *Douglas Co.*, Canyonville County Park, 2 mi east of Canyonville off Rt. 227, Berlese of duff, moss, wood, soil, elev. 1000', 6 November 1971, E. M. Benedict, ♂ ♂ ♀♀, 2 mi north of Melrose, elev. 400', berlese of rotted wood and duff, 7 February 1972, E. M. Benedict, ♂, 0.7 mi west of Scottsburg, near Umpqua River, elev. 300', Berlese of rotted myrtle heartwood, 11 December 1971, E. M. Benedict, ♂ ♀, Elliot State Forest, 1 mi south, 2 mi west of Ash, elev. 1100', Berlese of mixed duff from conifers, bigleaf maples, 11 December 1971, E. M. Benedict, ♀, 2 mi southeast of Day Creek on Rt. 227, elev. 1000', berlese of oak and madrone litter, 6 November 1971, E. M. Benedict, ♂.

Notes: Fig. 8, of the male from 2 mi southeast of Day Creek, and Fig. 7, of the described male from Canyonville County Park, though fairly close geographically, represent the extremes of variation in the termination of the anterior coxal process. Females are difficult to distinguish, except by locality (see Map 1) from those of *R. mineri*, as the postgenital structures are very similar (cf. Figs. 3 and 6).



Figs. 7-9. *Rhiscosomides josephi*. Fig. 7. Right anterior gonopod, lateral view. Fig. 8. Termination of gonopod of variant specimen, lateral view. Fig. 9. Left posterior gonopod, anterior view. Figs. 10-13. *R. benedictae*. Fig. 10. Right anterior gonopod, lateral view. Fig. 11. Termination of gonopod of variant specimen, lateral view. Fig. 12. Sternum and coxae of legs 2 of female, posterior view. Fig. 13. Left cyphopod and postgenital structure, posterior view.



Map 1. Coastal Oregon, showing distribution of species of *Rhiscosomides*. Dots, *R. mineri*. Squares, *R. josephi*. Triangles, *R. benedictae*. Circles, *R. malcolmi*.

Rhiscosomides benedictae n. sp.

Figs. 10-14

Types: Male holotype and female paratype from woods behind Marine Biological Institute, Charleston, Coos Co., Oregon, collected from a Berlese sample of spruce, alder and cedar duff by E. M. Benedict, 30 April 1967.

Description: Male holotype; size and nonsexual characters as described for *R. mineri*.

Anterior gonopods: anterior coxal processes long (Fig. 10), slightly curved, terminating in lateral and dorsal teeth and blunt mesal lobe; lateral branch small lamella. Posterior coxal processes with anterior branch small, rodlike, mesal branch upright, of moderate size, posterior branch relatively large, membranous anterior face. Telopodites lobed, interlocking with lateral extensions of anterior coxal processes. Ninth legs (Fig. 14) of usual form.

Female paratype typical of genus; process from second sternite (Fig. 12) thin, postgenital structures as in Fig. 13.

Distribution: OREGON: *Lincoln Co.*, State Forest Camp east of Waldport, 30 October 1960, D. R. Malcolm, ♂; *Benton Co.*, Rt. 34 at Benton Co. line, Berlese of maple and alder duff, 30 October 1960, Malcolm, ♂ ♂ ♀ ♀; *Douglas Co.*, 3.2 mi northeast of Scottsburg, elev. 400', Berlese of rotted wood and bark, 11 December 1971, E. M. Benedict, ♂ ♀ ♀; *Coos Co.*, 4 mi east, 2 mi south of Allegany, Weyerhaeuser Co. Millicoma Tree Farm, company road 6000, Berlese of rotted wood from riparian zone of Fall Creek, between steep canyon walls, 21 November 1971, E. M. Benedict, ♂ ♂ ♀ ♀.

Notes: Fig. 11 illustrates a slight variation in the form of the termination of the anterior coxal process of the anterior gonopod of the Benton Co. specimen. Those from the Millicoma Tree Farm are similar to this; at that place *R. benedictae* is nearly syntopic with *R. josephi*, which was taken from bark chips on a clear-cut slope, while *R. benedictae* was taken from litter in a riparian zone. It would be interesting to further explore the ecological situation between these two species.

Rhiscosomides malcolmi n. sp.

Figs. 15, 16

Types: Male holotype, female paratypes from 13 mi north, 5 mi west of Brookings, Curry Co., Oregon, collected 10 March 1972

from Sitka spruce duff on bluff overlooking ocean, by E. M. Benedict.

Description: Male holotype; length, 7.0 mm, width, 1.10 mm. Body form typical, as described for *R. mineri*.

Anterior gonopods (Fig. 15) robust, with anterior coxal processes bent anteriad at right angle, lateral branch strong, irregular in form. Posterior coxal processes with anterior branch bent posteriad at right angle, blade-like, mesal branch large, upright, posterior branch relatively large, with extensive fimbriate anterior edge. Telopodites as usual. Posterior gonopods (Fig. 16) as usual for genus.

Female paratype typical. Postgenital structures not distinguishable from those of *R. benedictae*.

Distribution: OREGON: *Curry Co.*, 14 mi east of Gold Beach, elev. 600', berlese of rotted wood and fir duff, 10 March 1972, E. M. Benedict, ♂ ♂ ♀ ♀.

Notes: Just as *R. josephi* and *R. mineri* females are difficult to separate, so are those of *R. malcolmi* and *R. benedictae*. At the locality near Gold Beach, *R. malcolmi* is nearly syntopic with *R. josephi*, which was taken there from tan oak duff. A mile away, *R. malcolmi* was collected from rotted wood and fir duff.

Rhiscosomides acovescor Shear

Fig. 17

Rhiscosomides acovescor Shear, 1972, Bull. Mus. Comp. Zool. 144(4): 262-263, figs. 451-458, ♂.

Types: Male holotype from *Sequoia* duff, S. P. Taylor State Park, Marin Co., California, collected 7 January 1962 by C. W. O'Brien, deposited in Museum of Comparative Zoology, examined.

Description: Male paratype; length, 6.0 mm, width, 1.10 mm (specimen broken). Body form as described for *R. mineri*, except as follows: 5 ocelli; sixth segment not at all enlarged, collum pigmented as other segments, not cream-white.

Anterior gonopods: anterior coxal processes of each side completely fused distally, separated by slight suture proximally, forming broad anterior plate, simple, not branched (Fig. 17). Posterior coxal processes with anterior branch small, weak, mesal branch thick, heavy, posterior branch thin, lacinate. Telopodites relatively large. Posterior gonopods (ninth legs) typical for genus.

Females unknown.

Distribution: Known only from the type locality.

Notes: The female paratype I designated in 1972 was not dis-

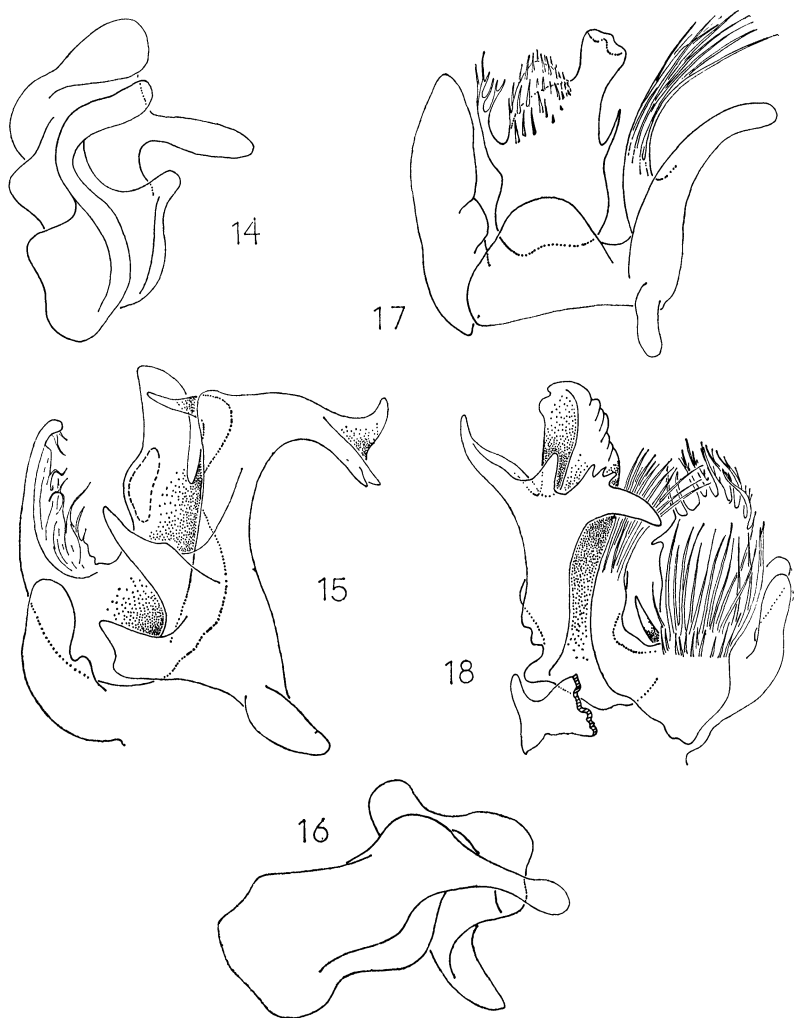


Fig. 14. Left posterior gonopod of *Rhiscosomides benedictae*, anterior view. Figs. 15, 16. *R. malcolmi*. Fig. 15. Right anterior gonopod, lateral view. Fig. 16. Left posterior gonopod, anterior view. Fig. 17. Right anterior gonopod of *R. acovescor*, lateral view. Fig. 18. Right anterior-gonopod of *R. trinitarium*, mesal view.

sected at that time and turned out to be immature. My interpretation of the posterior gonopods in that paper was likewise in error; see above. I have examined the tiny gonopods at high magnification under phase contrast, but cannot determine for certain if the large branch on the anterior gonopod made of closely appressed cuticular fibers is attached to the anterior or posterior coxal process. In *R. trinitarium* (see below) this branch is definitely a part of the posterior coxal process, while when gonopods of *R. acovescor* are dissected, it always seems to go with the anterior coxal process.

***Rhiscosomides trinitarium* n. sp.**

Fig. 18

Type: Male holotype from Butter Creek, elev. 3450', 12 mi south-east of Hyampom, Trinity Co., California, collected 22 July 1968, by H. Leech. Deposited in California Academy of Sciences.

Description: Male holotype; length 7.1 mm, width 1.12 mm. Body form as described for *R. acovescor*, but sixth segment slightly larger than seventh, collum cream-white.

Anterior gonopods: Anterior coxal process highly complex (Fig. 18), branches closely appressed in midline, but not fused; lateral branch large, blunt. Posterior coxal process with small, sharp anterior branch, posterior and mesal branches fused (?), complexly lacinate. Telopodites bilobed. Posterior gonopods (ninth legs) typical.

Female unknown.

Distribution: Known only from the type locality.

Notes: This species is clearly intermediate between *R. acovescor* and the more typical northern group of species.

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