

ARTÍCULO:

**Two new species of *Cyriocosmus* Simon, 1903 from Peru and the highest altitude record for the genus (Araneae, Theraphosidae, Theraphosinae)**

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ARTÍCULO:

**Two new species of *Cyriocosmus* Simon, 1903 from Peru and the highest altitude record for the genus (Araneae, Theraphosidae, Theraphosinae)**

**Fernando Pérez-Miles & Dirk Weinmann**

**Abstract:**

Two new species of *Cyriocosmus* (Theraphosinae) from Perú are described and illustrated. Both differ from most other species of *Cyriocosmus* in the absence of a striped pattern on the abdomen and males with the retrolateral branch of tibial apophysis distally incrassate and flattened. The cladistic relationships within the genus are reanalyzed including these new taxa. Specimens of the new species were collected at altitudes of between 2200 and 3000 m, these records constituting the highest altitudinal record for the genus.

**Key words:** Mygalomorphae, Amazonas, Tingo, Chachapoyas, Kuelap

**Taxonomy:** *Cyriocosmus pribiki* sp.nov.; *Cyriocosmus rogerioi* sp.nov.

**Dos nuevas especies de *Cyriocosmus* Simon, 1903 de Perú y el record de altura para el género (Araneae, Theraphosidae, Theraphosinae)**

**Resumen:**

Dos nuevas especies de *Cyriocosmus* (Theraphosinae) de Perú son descritas e ilustradas. Ambas se diferencian de la mayoría de las demás especies de *Cyriocosmus* por la ausencia de un patrón de diseño rayado en el abdomen y los machos presentando la rama retrolateral del apófisis tibial distalmente ensanchada y aplanada. Se reanalizaron las relaciones cladísticas dentro del género incluyendo estos dos nuevos taxa. Los individuos de las nuevas especies proceden de alturas de entre 2200 y 3000 m lo que constituye un record de altura para el género.

**Palabras clave:** Mygalomorphae, Amazonas, Tingo, Chachapoyas, Kuelap.

**Taxonomía:** *Cyriocosmus pribiki* sp.nov.; *Cyriocosmus rogerioi* sp.nov.

**Introduction**

The genus *Cyriocosmus* Simon, 1903 originally included the type species *Cyriocosmus sellatus* (Simon, 1889:218) and *Cyriocosmus elegans* (Simon, 1889:210) from the upper Amazonas and Orinoco regions respectively. Main apomorphy of the genus is the presence of a bifid apophysis on the male palpal organ. Mello-Leitão described two species *C. nigriventris* (Mello-Leitão, 1939:44) and *C. semifasciatus* (Mello-Leitão, 1939:46). Later the genus was revised exhaustively by Schiapelli & Gerschman, 1973; Pérez-Miles, 1998; and Fukushima et al., 2005. Vol (1999) described *C. leetzi* from Colombia, and Kaderka (2007) described *C. perezmilei* from Bolivia. The number of species described in this genus increased during last decade and the geographic distribution of the genus extends to: Argentina, Bolivia, Brazil, Colombia, Paraguay, Perú, Trinidad & Tobago and Venezuela. Taking these findings into account, the genus seems to be specious and additional undescribed species may be expected in the future.

As a result of the study of a sample collected in Peru by F. Pribik, two new species of *Cyriocosmus* were discovered which differ from known species. These species are here described, diagnosed and figured. As far as we know, one of these specimens collected at 3000 m, is the highest altitudinal record of a *Cyriocosmus*. At present the genus comprises 14 species: *C. bertae* Pérez-Miles, 1998; *C. blenginii* Pérez-Miles, 1998; *C. chicoi* Pérez-Miles, 1998; *C. elegans* (Simon, 1889); *C. fasciatus* (Mello-Leitao, 1930); *C. fernandoi* Fukushima et al., 2005; *C. leetzi* Vol, 1999; *C. nogueiranetoi* Fukushima et al., 2005; *C. perezmilei* Kaderka 2007; *C. ritae* Pérez-Miles 1998; *C. sellatus* (Simon, 1889); *C. versicolor* (Simon 1897); *Cyriocosmus pribiki* new species and *Cyriocosmus rogerioi* new species. A cladistic analysis was done including the new species and *C. perezmilei* Kaderka 2007 in the previous matrix of Fukushima et al., 2005.

## Methods

**Abbreviations:** AME= anterior median eyes, ALE= anterior lateral eyes, PME= posterior median eyes, PLE= posterior lateral eyes, OQ= ocular quadrangle (including lateral eyes); d= dorsal, p= prolateral, v= ventral, ALS= anterior lateral spinnerets, PLS= posterior lateral spinnerets. All measurements are in mm, number of maxillary cuspules is given in the format right-left. SMF = Senckenberg Museum, Frankfurt, Germany. Spination description follows Pérez-Miles (1998). Palpal organ structures abbreviations follows Bertani (2000); PA= paraembolic apophysis, PSK= prolateral superior keel. The new species and *C. perezmilei* Kaderka 2007, were included in the previous data matrix of Fukushima et al. (2003) adding two characters 28: Male tibial apophysis with retrolateral branch normal (0) incrassate and flattened (1) and 29: maxillary cuspules less than 99 (0) from 100 to 150 (1) more than 150 (2) (Table IV). A cladistic analysis using TNT package (Goloboff et al. 2003) was carried on. We made traditional heuristic search using mult\*15, collapsing rule tbr, and implied weighting (K= 3 to K=6).

## Results

### Taxonomy

#### *Cyriocosmus pribiki* new species

Figs. 1-6

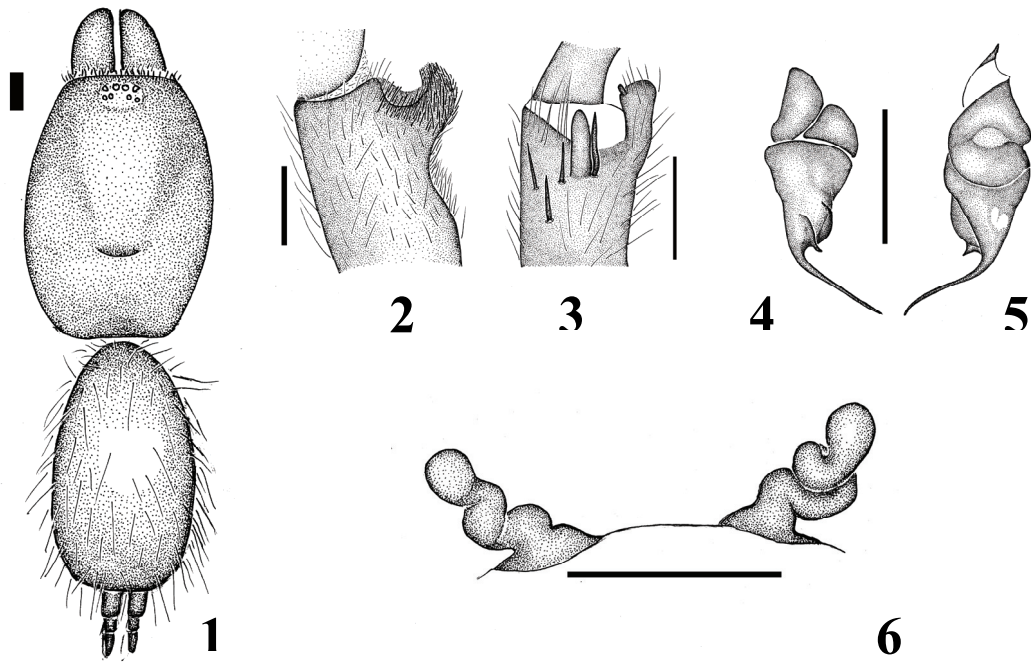
**TYPE MATERIAL.** Holotype male and two paratype females from Tingo, Amazonas, Peru, at about 2200 - 2500 m a.s.l., 22 October 1996, F. Pribik, deposited in SMF.

**ETYMOLOGY.** The specific name is a patronym in honour of Ferry Pribik the collector of the specimens used in this study.

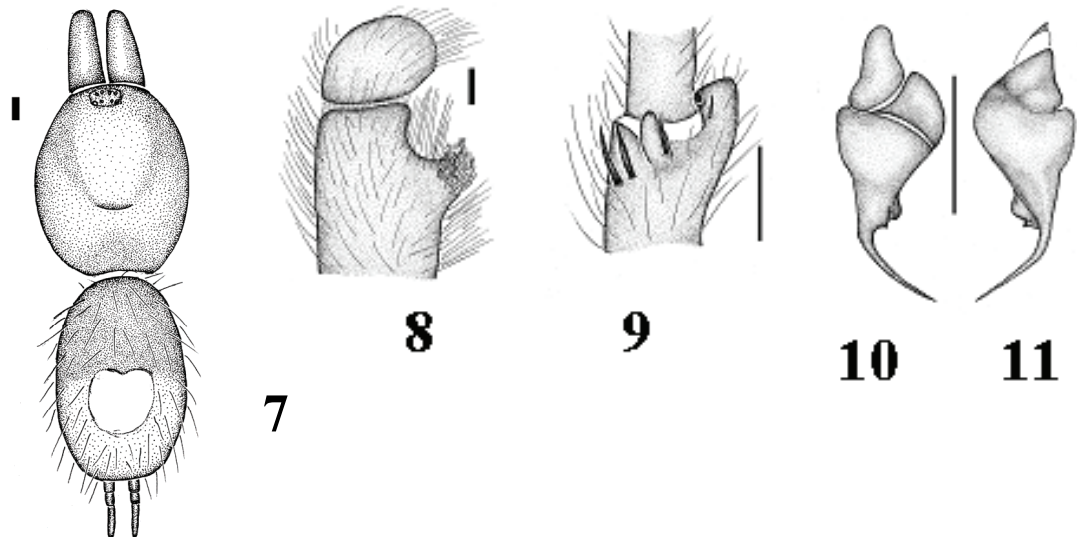
**DIAGNOSIS.** Differs from most species of *Cyriocosmus* by the absence of an abdominal striped pattern and the retrolateral branch of the tibial apophysis being distally incrassate and flattened. From *C. bertae* by the reduced number of labial cuspules (about 96 in *C. bertae* and 39 in *C. pribiki* males).

**DESCRIPTION.** MALE HOLOTYPE Total length, excluding chelicerae and spinnerets 15.0. *Carapace* length 7.4, width 5.8. Anterior eye row straight, posterior recurved. Eyes sizes and inter-distances: AME 0.24, ALE 0.34, PME 0.18, PLE 0.28, AME-AME 0.12, AME-ALE 0.06, PME-PME 0.50, PME-PLE 0.04, ALE-PLE 0.12. OQ length 0.58, width 1.06, clypeus 0.18. Fovea slightly procurved, width 1.0. Labium length 0.9, width 1.3 with 39 cuspules, maxillae with 130-121 cuspules. Sternum length 0.36, width 0.28. Chelicerae with 9 teeth on the promargin, second proximal larger. *Tarsi* I-IV densely scopulated, scopula I entire, II and III narrowly divided by longer thicker setae, IV widely divided by longer thicker setae. *Metatarsi* I scopulate on their apical  $\frac{3}{4}$ , II  $\frac{2}{3}$ , III  $\frac{1}{2}$ , IV  $\frac{1}{4}$ . Palpal tibia with retrolateral process covered with spiniform setae (Fig.2), retrolateral face of cymbium with field of spines. *Tibia* I with paired distal proventral apophysis, retrolateral larger, with the apical region wide and flattened and with a retrolateral spine; prolateral smaller with a prolateral spine (Fig. 3). Flexion of metatarsus touching the apex of the retrolateral apophyses. *Palpal organ* with PSK smooth; medium sized paraembolic apophysis and long embolus (Figs. 4-5). Length of leg and palpal segments in Table I. Spination: Femora I-IV and palp 0, Patellae I-IV and palp 0. Tibiae I 1v, 1p; II 3v, 2p; III 6v, 1p, 2r; IV 6v, 1r; palp 0. Metatarsi I 1v; II 2v; III 4v, 2p, 2r; IV 8v, 3p, 2r. Tarsi I-IV and palp 0. Cephalothorax and legs II-IV light brown; palps legs I and abdomen darker. Type III urticating hairs present. Spinnerets: ALS monosegmented, claviform, PLS longer, apical segment digitiform.

FEMALE PARATYPE Total length, excluding chelicerae and spinnerets 15.8. *Carapace* length 6.8, width 5.9. Anterior eye row slightly procurved, posterior recurved. Eyes sizes and inter-distances: AME 0.22, ALE 0.28, PME 0.26, PLE 0.36, AME-AME 0.14, AME-ALE 0.14, PME-PME 0.46, PME-PLE 0.02, ALE-PLE 0.12. OQ length 0.64, width 1.26, clypeus 0.30. Fovea slightly procurved, width 1.4. Labium length 1.1, width 1.5 with 66 cuspules, maxillae with 126-132 cuspules. Sternum length 0.36, width 0.32. Chelicerae with 9 teeth on the promargin. *Tarsi* I-IV densely scopulated, scopula I entire, II narrowly divided by longer thicker setae, III - IV widely divided by longer subconical setae. *Metatarsi* I scopulate on their apical  $\frac{3}{4}$ , II  $\frac{2}{3}$ , III  $\frac{1}{2}$ , IV  $\frac{1}{4}$ . Length of leg and palpal segments in Table II. Spination: Femora I-IV and palp 0, Patellae I-IV and palp 0. Tibiae I - II 0; III 3v; IV 2v, 2r; palp 0. Metatarsi I 0; II 2v; III 6v, 2p, 2r; IV 5v, 3r. Tarsi I-IV and palp 0. *Spermathecae* two separated spiral receptacles with glo-



**Figs 1-6:** Holotype male *Cyriocosmus pribiki* new species; 1: dorsal view; 2: right palpal tibia with a retrolateral process covered with spiniform setae; 3: tibia I with paired distal proventral apophysis, ventral view; 4-5: palpal organ, showing the prolateral superior keel and prolateral inferior keel (= paraembolic apophysis). 6: Paratype female *C. pribiki* new species, spermathecae dorsal view (Scales 1mm).



**Figs 7-11:** Holotype male *Cyriocosmus rogerioi* new species; 7: dorsal view; 8: right palpal tibia with a retrolateral process covered with spiniform setae; 9: tibia I with paired distal proventral apophysis, ventral view; 10-11: palpal organ, showing the prolateral superior keel and prolateral inferior keel (= paraembolic apophysis) (Scales 1mm).



**Fig. 12:** Single cladogram of *Cyriocosmus* (Fit 4.13 with  $K = 6$ ,  $C_i = 51$ ,  $R_i = 69$ ) obtained using TNT package (implied weighting, collapsing rule tbr, mult\*15). The topology of the cladogram was the same using concavity index 4,5 and 6.

bular fundus and convex basal plates (Fig. 6). Cephalothorax and legs light brown; abdomen homogeneous and darker. Type III urticating hairs present. Spinnerets: ALS monosegmented, claviform, PLS longer, apical segment digitiform.

**DISTRIBUTION:** Only known from the typical locality, landscape is high cloud forest.

#### *Cyriocosmus rogerioi* new species

Figs. 7-11

**TYPE MATERIAL.** Holotype male from Kuelap, Chachapoyas, Peru, at about 3000 m a.s.l., F. Pribik, 20 Oct. 1996, deposited in SMF.

**ETYMOLOGY.** The specific name is a patronym in honour of Rogério Bertani, an important Brazilian mygalomorph researcher and one of the authors of a recent deep revision of the genus *Cyriocosmus*.

**DIAGNOSIS.** Differs from most species of *Cyriocosmus* by the absence of an abdominal striped pattern and the

retrolateral branch of the tibial apophysis being distally incrassate and flattened. From *C. bertae* by the reduced number of labial cuspules (56) and from *C. pribiki* new species in the increased number of maxillary cuspules (about 200) and in the longer embolus of the palpal organ.

**DESCRIPTION.** MALE HOLOTYPE Total length, excluding chelicerae and spinnerets 19.8. *Carapace* length 8.4, width 7.5. Anterior eye row straight, posterior recurved. Eyes sizes and inter-distances: AME 0.26, ALE 0.34, PME 0.18, PLE 0.22, AME-AME 0.14, AME-ALE 0.08, PME-PME 0.56, PME-PLP 0.04, ALE-PLP 0.14. OQ length 0.64, width 1.24, clypeus 0.18. Fovea slightly procurved, width 1.6. Labium length 0.9, width 1.1 with 56 cuspules, maxillae with 226-211 cuspules. Sternum length 0.38, width 0.33. Chelicerae with 9 teeth on the promargin, second proximal larger, 9 small teeth in a proximal group retrolateral. *Tarsi* I-IV densely scopulate, scopula I entire, II and III narrowly divided by longer thicker setae, IV widely divided by longer thicker setae. *Metatarsi* I scopulate on their apical  $\frac{3}{4}$ , II  $\frac{2}{3}$ , III  $\frac{1}{2}$ , IV  $\frac{1}{4}$ . Palpal tibia with retrolateral process covered

with spiniform setae (Fig.8), retrolateral face of cymbium with a field of spines. *Tibia* I with paired distal proventral apophyses, retrolateral larger, with the apical region wide, flattened and with a prolateral and a retrolateral spine; prolateral apophysis smaller with a prolateral spine (Fig.9). Flexion of metatarsus touching the apex of the retrolateral apophysis. *Palpal organ* with PSK smooth, medium sized paraembolic apophysis and long embolus (Fig.10). Length of leg and palpal segments in Table III. Spination: Femora I-IV and palp 0, Patellae I-IV and palp 0. Tibiae I 1v; II 5v, 1p, 2d; III 6v, 1p, 2r; IV 6v, 2p; palp 0. Metatarsi I 1v; II 2v; III 4v, 4p, 4r; IV 8v, 3p, 2r. Tarsi I-IV and palp 0. Cephalothorax, coxae and trochanters light brown; other leg segments and abdomen darker, with the anterior half darker than posterior. Type III urticating hairs present. Spinnerets: ALS monosegmented, claviform, PLS longer, apical segment digitiform.

**DISTRIBUTION:** Only known from the typical locality, landscape is high cloud forest.

## Discussion

### PHYLOGENETIC ANALYSIS AND COMMENTS

Including the two new species and *C. perezmilesi* in the previous matrix of Fukushima et al. (2005) and using implied weighting ( $k=4$  to 6) only one tree of maximum fit (4.264) was found (Fig. 12).

The genus *Cyriocosmus* was recovered as monophyletic and supported by the presence of paraembolic apophysis long (with reversion to short in some species), PSK weakly developed (with some reversions), spermathecae

with convex basal plate (with some reversions) and blackish cephalic pattern (with several reversions). *Cyriocosmus nogueiranetoi* resulted as the sister group of the rest of the species as in Fukushima et al. (2005). A symmetric clade including *C. elegans* sister of *C. leetzi*, and *C. fasciatus* sister of *C. fernandoi* was supported in the presence of 4 lateral stripes on the abdomen and white stripes present on male legs. The rest of the species are in another pectinate clade supported by the presence of 150 or more maxillary cuspules. In this clade *C. ritae* is the sister group of the other species. The clade *C. chicoi* + the rest of *Cyriocosmus* species is supported by the absence of a male palpal process on the retrolateral tibiae. The clade *C. blenginii* + the rest is supported by the reversion in the blackish cephalic pattern and the clade *C. sellatus* + the rest is supported by the fusion of PA with PSK and homogeneous dorsal abdominal pattern. *Cyriocosmus bertae* + the rest is supported by the presence of short paraembolic apophysis and PSK being well developed. *C. pribiki* new species and *C. rogerioi* new species appear as sister species supported by the incrassate and flattened retrolateral branch of the male tibial apophysis and the parallel presence of a field of spines on retrolateral cymbium.

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**Table I.**  
Male *Cyriocosmus pribiki* new species, leg and palpal segment dimensions

	I	II	III	IV	Palp
Femur	5.7	5.2	4.5	5.5	3.2
Patella	3.4	3.0	2.5	3.0	2.4
Tibia	4.0	3.4	2.4	4.5	2.8
Metatarsus	3.8	3.4	3.3	4.8	---
Tarsus	2.5	2.3	2.3	2.9	1.1

**Table II.**  
Female *Cyriocosmus pribiki* new species, leg and palpal segment dimensions.

	I	II	III	IV	Palp
Femur	5.3	4.3	4.0	5.4	4.0
Patella	3.4	2.3	2.5	2.7	2.5
Tibia	3.3	2.3	2.4	3.4	2.8
Metatarsus	2.8	2.7	2.6	4.4	---
Tarsus	2.4	2.2	1.9	2.5	2.0

**Table III.**  
Male *Cyriocosmus rogerioi* new species, leg and palpal segment dimensions

	I	II	III	IV	Palp
Femur	6.0	5.7	5.0	6.3	4.1
Patella	4.0	3.8	2.8	3.4	2.4
Tibia	4.1	3.7	3.2	4.8	3.3
Metatarsus	4.9	3.8	3.4	5.6	---
Tarsus	2.6	2.6	2.1	3.3	1.9

Table IV.

Data matrix showing the distribution of character states used in the cladistic analysis, modified from Fukushima et al. (2005); three taxa and two characters were added, see text.

	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9			
<i>Homoeomma montanum</i>	0	-	-	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	?		
<i>Plesiopelma insulare</i>	0	-	-	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0	0	-	0	0	0	?		
<i>Plesiopelma</i> sp.	0	-	-	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	1	0	0	1	1	0	0	-	0	?	0	?		
<i>Hapalopus</i> sp.	0	-	-	1	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	1	0	0	1	1	0	1	2	0	0	?	?		
<i>Hapalopus formosus</i>	?	?	?	0	0	0	0	0	-	1	1	0	0	0	0	0	1	0	0	0	0	0	1	1	0	1	2	1	0	0	?		
<i>Hapalopus butantan</i>	1	2	0	0	0	1	0	0	-	1	1	0	0	2	1	1	1	1	0	0	1	2	0	0	0	0	-	0	0	0	0		
<i>Maraca horrida</i>	0	-	-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	-	0	?	0	?		
<i>Grammostola actaeon</i>	0	-	-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	-	0	0	0	?		
<i>Cyriocosmus bertae</i>	1	0	1	0	0	1	0	0	?	?	?	?	?	?	?	?	?	0	1	0	0	1	1	0	0	-	0	0	0	2			
<i>Cyriocosmus blenginii</i>	2	0	0	0	0	?	1	0	?	?	?	?	?	?	?	?	0	?	?	?	?	?	?	?	?	0	1	2	0	?	?		
<i>Cyriocosmus chicoi</i>	2	0	0	0	0	0	1	0	1	0	0	1	0	1	0	1	0	0	0	0	0	0	1	1	1	1	2	0	0	2			
<i>Cyriocosmus elegans</i>	1	0	1	0	0	0	0	1	1	0	0	1	1	1	1	1	1	0	0	0	0	1	1	1	1	1	1	0	1	0	?		
<i>Cyriocosmus fasciatus</i>	2	1	0	0	0	1	0	1	1	0	1	0	1	0	1	1	1	0	0	0	0	1	1	1	1	1	1	1	0	1	0	?	
<i>Cyriocosmus fernandoi</i>	2	1	0	0	0	1	1	0	1	1	0	0	1	0	0	1	1	0	1	0	0	1	1	1	1	1	1	1	0	1	0	0	
<i>Cyriocosmus leetzi</i>	1	0	0	0	0	1	0	1	1	0	0	1	1	1	1	1	1	0	0	0	0	1	1	1	1	1	1	0	1	0	?		
<i>Cyriocosmus nogueiranae</i>	2	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1	1	0	0	0	0	1	1	1	1	1	2	0	0	0	0		
<i>Cyriocosmus sellatus</i>	2	0	1	0	0	1	0	1	0	1	1	0	0	1	1	1	0	0	0	0	0	1	1	0	0	0	-	0	0	0	?		
<i>Cyriocosmus versicolor</i>	1	0	1	0	0	1	0	0	1	1	0	0	1	0	0	1	0	1	0	0	0	1	1	1	1	0	-	0	0	?			
<i>Cyriocosmus ritae</i>	2	1	0	0	0	1	0	0	?	?	?	?	?	?	?	?	?	3	2	1	0	1	1	1	1	2	1	?	0	2			
<i>Cyriocosmus pribiki</i>	1	0	1	0	0	0	1	1	0	0	1	0	0	1	1	1	1	0	1	0	0	1	1	0	0	-	0	?	1	1			
<i>Cyriocosmus rogerioi</i>	1	0	1	0	0	0	0	0	?	?	?	?	?	?	?	?	?	1	0	0	0	1	1	0	0	-	0	0	1	2			
<i>Cyriocosmus perezmitlesi</i>	1	1	1	0	0	0	0	0	1	1	0	0	1	0	1	1	1	?	1	0	0	1	1	0	1	2	0	?	0	?			

