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# A Revision of the Neotropical Spiders of the New Genus Apopyllus (Araneae, Gnaphosidae) 

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#### Abstract

The new genus Apopyllus is established for those gnaphosids, found from southern Mexico to Chile and Argentina, in which males have a folded retrolateral tibial apophysis, an incised cymbium, and an elongated embolus terminating in a retrolateral loop supported by a membranous, bifid tegular extension, and females have a pair of paramedian epigynal openings leading to highly convoluted ducts. Zelotes silvestrii (Simon), the type species, as well as $Z$. melanophorus Mello-Leitão, Z. pau- per Mello-Leitão, Z. iheringi Mello-Leitão, Gytha argentina Mello-Leitão, and Herpyllus suavis Simon are transferred to Apopyllus. Two specific names, $A$. melanophorus and $A$. argentina, are newly synonymized with $A$. silvestrii. The male of A. iheringi is described for the first time. Four new species are described: $A$. malleco from Chile, $A$. huanuco from Peru, A. now from Curaçao, and $A$. ivieorum from Mexico.


## INTRODUCTION

This paper, the nineteenth in a series on the spider family Gnaphosidae, deals with a small group of Neotropical species (herein named Apopyllus) that has not previously been recognized as a genus. Those of its members which have been described have been erroneously placed in Zelotes, Gytha, and Herpyllus. As is frequently the case in Neo-
tropical spiders, these generic allocations seem entirely random, for those three genera are not closely related to each other (and will certainly fall into three different subfamilies if and when an acceptable higher classification of the numerous gnaphosid genera is achieved), and the members of Apopyllus share no special characters with any of their

[^0]type species. Zelotes and its relatives, for example, all have a metatarsal preening comb that is absent in Apopyllus, and Gytha (shown by Platnick, 1981, to be a synonym of Eilica) has typical laroniine cheliceral modifications not found in Apopyllus. The placement of Apopyllus species in Herpyllus is not contradicted by any such obvious somatic feature, but both the male and female genitalia of the two groups are about as different as those of any two gnaphosid genera could be. Whereas both the male palp and female epigynum of Herpyllus are simple (Platnick and Shadab, 1977), those of Apopyllus are greatly modified and hence easily recognizable. The retrolateral tibial apophysis of the male palp is folded into an elaborate structure (as in figs. 1,2 ) of unprecedented complexity within the family. The cymbium is retrolaterally incised, with the resulting cavity accommodating the terminal retrolateral loop of an elongate embolus supported by a membranous, bifid extension of the tegulum (as in figs. 11, 12). The female epigynum consists externally of an anterior ridge and a pair of paramedian openings (as in figs. 3-10) leading to internal ducts so highly convoluted that no two specimens have exactly the same configuration (indeed, the ducts of the right and left sides of a single specimen are seldom bilaterally symmetrical).

In addition to supplying the only synapomorphies known for the genus, these complex genitalia also provide the only clues to its relationships, suggesting that Apopyllus is most closely related to the Neotropical genus Apodrassodes Vellard, recently revised by Platnick and Shadab (1983). Males of Apodrassodes have a similarly elongate embolus that extends around to the retrolateral side of the cymbium and terminates in a single coil supported by a membranous tegular extension, although the extension is never so pronounced as in Apopyllus and is entire rather than bifid.

The only species of Apopyllus that is at all frequently found in collections, and that has been referred to more than once in the literature, is the type species, A. silvestrii ( $\mathrm{Si}-$ mon). Common in Patagonia, this species resembles Apodrassodes araucanius (Chamberlin) in having a distribution that extends into the Andes of Bolivia and Peru;
the northern records are from elevations above 3000 meters. Argentinean specimens of this species were apparently identified as Herpyllus australis (Holmberg, 1881) by Mello-Leitão (1940, p. 46, figs. 44, 45). Holmberg's species (originally assigned to Drassus) was based on a single penultimate male from Patagonia that is lost and probably destroyed. Even if it were available, however, it is doubtful that this juvenile specimen could confidently be assigned to any species, so we regard Holmberg's name as a nomen dubium rather than a senior synonym of $A$. silvestrii.
In addition to material in the collection of the American Museum of Natural History (AMNH), specimens were obtained through the kindness of the following institutions and curators: California Academy of Sciences (CAS), Dr. W. Pulawski; Museum of Comparative Zoology (MCZ), Dr. H. Levi; Museo de La Plata (MLP), Dr. R. Arrozpide; Muséum National d'Histoire Naturelle (MNHN), Dr. M. Hubert; Museu Nacional do Rio de Janeiro (MNRJ), Dr. A. Timotheo da Costa; Museu de Zoologia, Universidade de São Paulo (MSP), the late Dr. H. Reichardt; Michigan State University (MSU), Dr. R. Fischer; University of California at Berkeley (UCB), Drs. E. Schlinger and C. Griswold. We are especially indebted to Dr. H. W. Levi of Harvard University for arranging for the loan of several Mello-Leitão gnaphosid types during his recent visit to MNRJ, and to Dr. R. J. Raven of the Queensland Museum for reviewing a draft of the manuscript. The format of the descriptions follows that of Platnick and Shadab (1975); all measurements are in millimeters.

## APOPYLLUS, NEW GENUS

Type Species: Zelotes silvestrii (Simon, 1905).

Etymology: The generic name is an arbitrary combination of letters and is masculine in gender.

Diagnosis: Specimens of Apopyllus can be distinguished from all other gnaphosids by the genitalic characters discussed above.

Description: Total length 2.6-7.7. Carapace oval in dorsal view, rounded anteriorly, truncated posteriorly, widest between coxae II and III, narrowed opposite palpi, light to


Figs. 1-4. Apopyllus silvestrii (Simon). 1. Palp, ventral view. 2. Palp, retrolateral view. 3. Epigynum, ventral view. 4. Epigynum, dorsal view.
dark brown, usually with black reticulations, coated with recumbent white and erect black setae; cephalic area flattened; thoracic groove long, longitudinal; lateral margins distinctly keeled. From front, both eye rows strongly procurved; from above, anterior row slightly recurved, posterior row slightly procurved; AME circular, dark, PME triangular, light, ALE and PLE oval, light; lateral eyes usually larger than medians; AME separated by slightly less than their diameter or more, closer to ALE; PME separated by at most slightly more than their diameter, by their diameter or less from PLE; lateral eyes of each side separated by their diameter or less; MOQ usually slightly longer than wide, widest in back. Clypeal height greater than AME diameter. Chelicerae with three large promarginal teeth and one retromarginal denticle or small tooth. Endites short, rectangular, obliquely depressed; labium narrow, rebordered distally, widened posteriorly; edges of sternum rebordered, with dense fringe of long black setae. Leg formula 4123. Typical leg spination pattern (only surfaces bearing spines listed): femora: I, II d1-1-1, p0-0-1; III d1-1-1, p0-1-1, r0-1-1; IV d1-1-1, p0-1-1, r0-$0-1$; patellae III, IV p0-1-0, r0-1-0; tibiae: I
v0-1p-0; II v1r-2-0; III d1-0-0, p1-1-1, v1p-2-2, r0-1-1; IV d1-1-0, p1-1-1, v1p-2-2, r1-1-1; metatarsi: I, II v2-0-0; III p1-2-2, v2-22, r1-1-2; IV p1-2-2, v2-2-2, r1-2-2. Legs dark brown except for lighter tarsi; tarsi lightly scopulate, with two dentate claws and weak claw tufts; trochanters slightly notched; metatarsi without preening combs; distal segments with single row of long trichobothria. Abdomen gray, lightest ventrally, in A. now with median dorsal longitudinal pale white stripe; males with shiny brown anterior scutum reaching past first pair of muscle impressions; spinnerets long, narrow, anteriors separated at base by almost twice their basal width, with one ventral and about five dorsal spigots. Male palp with folded retrolateral tibial apophysis, incised cymbium, and long embolus terminating in retrolateral loop supported by membranous, bifid tegular extension. Epigynum with anterior ridge and paramedian openings leading to convoluted ducts.

## Apopyllus silvestrii (Simon), new combination

Figures 1-4
Melanophora silvestrii Simon, 1905, p. 4 (male and female syntypes from Missioneros, Río San-
ta Cruz, Santa Cruz, Argentina, in MNHN, examined).
Zelotes silvestrii: Petrunkevitch, 1911, p. 151. Roewer, 1954, p. 469. Bonnet, 1959, p. 4951.
Zelotes melanophorus Mello-Leitão, 1941, p. 169, fig. 59 (male and female syntypes from Colalao, Tucumán, Argentina, in MLP, examined). Roewer, 1954, p. 469. NEW SYNONYMY.
Gytha argentina Mello-Leitão, 1944, p. 351, fig. 42 (male holotype from La Plata, Buenos Aires, Argentina, in MLP, examined). Roewer, 1954, p. 564. NEW SYNONYMY.

Diagnosis: Males can be distinguished from those of $A$. ivieorum by the more proximal cymbial incision, from those of $A$. iheringi by the distally more narrow retrolateral tibial apophysis, and from those of $A$. now by the longer embolus (figs. 1, 2); the long, straight paramedian epigynal ducts (figs. 3, 4) are diagnostic for females.

Male: Total length $4.83 \pm 0.44$. Carapace $2.05 \pm 0.16$ long, $1.58 \pm 0.14$ wide. Femur II $1.26 \pm 0.12$ long. Eye sizes and interdistances: AME 0.07, ALE 0.09, PME 0.08, PLE 0.09 ; AME-AME 0.05, AME-ALE 0.01, PME-PME 0.02, PME-PLE 0.04, ALE-PLE 0.02 . MOQ length 0.19 , front width 0.19 , back width 0.18 . Embolus long, protruding past proximal edge of tarsus (fig. 1); retrolateral tibial apophysis narrowed distally (fig. 2). Leg spination: tibiae: I v0-2-0; III, IV p0-1-1.

Female: Total length $6.02 \pm 0.69$. Carapace $2.46 \pm 0.18$ long, $1.82 \pm 0.12$ wide. Femur II $1.44 \pm 0.12$ long. Eye sizes and interdistances: AME 0.06, ALE 0.09, PME 0.07 , PLE 0.08; AME-AME 0.05, AME-ALE 0.01, PME-PME 0.05, PME-PLE 0.06, ALEPLE 0.05. MOQ length 0.21 , front width 0.17 , back width 0.18 . Anterior ridge of epigynum relatively narrow (fig. 3); paramedian ducts long, straight (fig. 4). Leg spination: tibiae: II v0-1p-0; IV p0-1-1, $\mathrm{r} 0-1-1$.

Material Examined: Argentina: Buenos Aires: La Plata (M. Birabén, MLP), 1 ' (type). Chubut: Epuyén, June 12, 1962 (A. Kovács, AMNH, MSU), 78, 5\$, Aug. 2, 1962 (A. Kovács, AMNH), 1̊́, 18, Nov. 18, 1962 (A. Kovács, AMNH), 1̊, Aug. 5, 1966 (A. Kovács, AMNH), 1 ; $; 19.5 \mathrm{~km}$. E Shaman, elevation 650 m., Nov. 19, 1966 (E. I. Schlinger, M. E. Irwin, UCB), 19. Río Negro: El Bolsón, July 8, 1961 (A. Kovács, AMNH), 1̂̊, Aug.

10, 1961 (A. Kovács, AMNH), 1̊̂, May 2027, 1962 (A. Kovács, AMNH), 1̊́, 1\&, July 20, 1962 (A. Kovács, AMNH), 29, Sept. 1962 (A. Kovács, AMNH), 1̊, 29 ; Los Repollos, May 5, 1962 (A. Kovács, AMNH), 19. Santa Cruz: Missioneros, Río Santa Cruz (F. Silvestri, MNHN), 1s, 1 (types). Tucuman: Colalao (M. Birabén, MLP), 1ô, 1 it (types). Bolivia: Potosí: 30 mi . N Potosí, elevation 13,000 ft., Feb. 20, 1951 (E. S. Ross, A. E. Michelbacher, CAS), 19; 50 mi . N Potosí, Feb. 22, 1951 (E. S. Ross, A. E. Michelbacher, CAS), 1ô. Santa Cruz: San Antonio del Parapetí, Sept. 1-5, 1964 (B. Malkin, AMNH), 1s.. Province ?: Cuticucho, Songo Valley, elevation 3800 m., Jan. 31, 1954 (Forster, Schindler, AMNH), 18́; Songotal, elevation 3800 m., Feb. 30, 1953 (Forster, Schindler, AMNH), 19. Chile: Aysén: Chile Chico, elevation 250 m ., dunes near lake, Nov. 21, 1966 (E. I. Schlinger, M. E. Irwin, UCB), 1ô. Peru: Cuzco: Ocongate, elevation 11,000 ft., Apr. 6-11, 1947 (J. C. Pallister, AMNH), 19. Puno: Puno, elevation 3900 m., June-Nov. 1947 (W. Weyrauch, AMNH), 2;; 60 km. N Puno, altiplano, Feb. 28, 1951 (E. S. Ross, A. E. Michelbacher, CAS), 1 ô, 1 it. Province ?: San Mateo, elevation 3000 m., Jan. 7, 1939 (W. Weyrauch, AMNH), 1 if.

Distribution: Southern Chile and Argentina north to Peru.

Synonymy: Mello-Leitão provided no characters by which to distinguish Zelotes melanophorus or Gytha argentina from $A$. silvestrii, and there appear to be none.

Apopyllus pauper (Mello-Leitão), new combination

Figures 5, 6
Zelotes pauper Mello-Leitão, 1942, p. 413, fig. 39 (female holotype from General Capdevila, Chaco, Argentina, in MLP, examined). Roewer, 1954, p. 469.

Diagnosis: The anteriorly expanded paramedian epigynal ducts (figs. 5, 6) are diagnostic.

Male: Unknown.
Female: Total length 3.76. Carapace 1.85 long, 1.51 wide. Femur II 1.17 long. Eye sizes and interdistances: AME 0.05, ALE 0.08, PME 0.06, PLE 0.08; AME-AME 0.04, AME-ALE 0.03, PME-PME 0.07, PME-PLE


Figs. 5-10. 5, 6. Apopyllus pauper (Mello-Leitão). 7, 8. A. malleco, new species. 9, 10. A. huanuco, new species. 5, 7, 9. Epigynum, ventral view. 6, 8, 10. Epigynum, dorsal view.
0.05 , ALE-PLE 0.04. MOQ length 0.21, front width 0.14 , back width 0.18 . Paramedian epigynal ducts expanded anteriorly into bulbous form (fig. 5); most laterally situated ducts widened (fig. 6). Leg spination: tibia II v0$1 \mathrm{p}-0$.

Material Examined: Only the holotype, collected by M. Birabén.

Distribution: Known only from Chaco, Argentina.

## Apopyllus iheringi (Mello-Leitão), new combination <br> Figures 11-14

Zelotes iheringi Mello-Leitão, 1943, p. 262 (female holotype from Paraíba do Norte, Paraíba, Brazil, in MNRJ, examined). Roewer, 1954, p. 468.

Diagnosis: The distally widened retrolateral tibial apophysis in males (fig. 12) and the combination of a wide, straight anterior epigynal ridge and anteriorly tightly curled paramedian epigynal ducts in females (figs. 13, 14) are diagnostic.

Male: Total length 4.10. Carapace 1.97 long, 1.56 wide. Femur II 1.26 long. Eye sizes and interdistances: AME 0.05, ALE 0.07,

PME 0.05, PLE 0.09; AME-AME 0.08, AME-ALE 0.01, PME-PME 0.05, PME-PLE 0.05 , ALE-PLE 0.03 . MOQ length 0.21 , front width 0.18 , back width 0.15 . Cymbium widened at level of retrolateral incision (fig. 11); retrolateral tibial apophysis widened distally (fig. 12). Leg spination: tibiae III, IV p0-1-1.

Female: Total length 4.97-5.98. Carapace 2.02-2.43 long, 1.51-1.73 wide. Femur II 1.19-1.47 long. Eye sizes and interdistances: AME 0.06, ALE 0.09, PME 0.07, PLE 0.09; AME-AME 0.05, AME-ALE 0.02, PMEPME 0.07, PME-PLE 0.06, ALE-PLE 0.03. MOQ length 0.20 , front width 0.18 , back width 0.21 . Anterior epigynal ridge wide, straight (fig. 13); paramedian ducts tightly curled anteriorly (fig. 14). Leg spination: tibiae: II v0-1p-0; III p0-1-1.

Material Examined: Brazil: Minas Gerais: Passa Quatro (MNRJ), 1 ố (label reads "Echemus nigerrimus typo" in Mello-Leitão's handwriting, but this is only a manuscript name). Paraíba: Paraíba do Norte (R. von Ihering, MNRJ), 19 (type). São Paulo: Emas, Pirassununga, July 29, 1946 (O. Schubart, MSP), 19; Piraju (O. Schubart, MSP), 19.

Distribution: Known only from eastern Brazil.


Figs. 11-14. Apopyllus iheringi (Mello-Leitão). 11. Palp, ventral view. 12. Palp, retrolateral view. 13. Epigynum, ventral view. 14. Epigynum, dorsal view.

## Apopyllus malleco, new species

Figures 7, 8
Type: Female holotype from 10 km . west of Collipulli, Malleco, Chile (January 4, 1961; J. K. Greer), deposited in AMNH through the courtesy of Dr. R. L. Fischer.

Etymology: The specific name is a noun in apposition taken from the type locality.

DIAGNOSIS: The sinuous anterior epigynal ridge (fig. 7) is diagnostic.

Male: Unknown.
Female: Total length 5.83. Carapace 1.98 long, 1.55 wide. Femur II 1.19 long. Eye sizes and interdistances: AME 0.05, ALE 0.06, PME 0.05, PLE 0.07; AME-AME 0.02, AME-ALE 0.02, PME-PME 0.03, PME-PLE 0.05 , ALE-PLE 0.05 . MOQ length 0.21 , front width 0.12 , back width 0.15 . Anterior epigynal ridge sinuous (fig. 7); paramedian ducts extending past anterior edge of spermathecae (fig. 8). Leg spination: femur IV p0-0-1; patellae III, IV p0-0-0; tibiae: III p0-1-1; IV p1-0-1.

Material Examined: Only the holotype. Distribution: Known only from Malleco, Chile.

## Apopyllus huanuco, new species

Figures 9, 10
Type: Female holotype taken at an elevation of 2100 m . at Acomayo, Huánuco, Peru (July 1946; F. Woytkowski), deposited in AMNH.

Etymology: The specific name is a noun in apposition taken from the type locality.

DIAGNOSIS: The broadly arched anterior epigynal ridge (fig. 9) and loosely coiled anterior ducts (fig. 10) are diagnostic.

Male: Unknown.
Female: Total length 5.07-5.69. Carapace 1.81-2.23 long, 1.26-1.80 wide. Femur II 1.06-1.47 long. Eye sizes and interdistances: AME 0.05, ALE 0.05, PME 0.06, PLE 0.07; AME-AME 0.07, AME-ALE 0.03, PMEPME 0.05, PME-PLE 0.06, ALE-PLE 0.05. MOQ length 0.20 , front width 0.17 , back width 0.18 . Anterior epigynal ridge broadly arched (fig. 9); anterior ducts only loosely coiled (fig. 10). Leg spination: femur IV r0-1-1; tibiae III, IV p0-1-1.

Material Examined: One female taken with the holotype (AMNH) and one female


Figs. 15-18. 15, 16. Apopyllus ivieorum, new species. 17, 18. A. suavis (Simon). 15. Palp, ventral view. 16. Palp, retrolateral view. 17. Epigynum, ventral view. 18. Epigynum, dorsal view.
taken at Huánuco, Huánuco, Peru, Jan. 27, 1947 (J. C. Pallister, AMNH).

Distribution: Known only from Huánuco, Peru.

> Apopyllus suavis (Simon), new combination Figures 17, 18
Herpyllus suavis Simon, 1893, p. 455, fig. 25 (two female syntypes from Colonia Tovar, Aragua, Venezuela, in MNHN, examined). Roewer, 1954, p. 422. Bonnet, 1957, p. 2174.
Diagnosis: The widened anterior epigynal ridge (fig. 17) and the large posterior extensions of the paramedian ducts protruding beyond the anterior edge of the spermathecae (fig. 18) are diagnostic.

Male: Unknown.
Female: Total length 4.41, 4.62. Carapace 1.91, 2.05 long, $1.51,1.66$ wide. Femur II 1.12, 1.19 long. Eye sizes and interdistances: AME 0.05, ALE 0.07, PME 0.07, PLE 0.07; AME-AME 0.07, AME-ALE 0.04, PMEPME 0.06, PME-PLE 0.05, ALE-PLE 0.04. MOQ length 0.23 , front width 0.17 , back width 0.20 . Anterior epigynal ridge widened
(fig. 17); paramedian ducts with large posterior extensions protruding beyond anterior edge of spermathecae (fig. 18). Leg spination: femur IV r0-1-1; tibia II v0-1p-0.

Material Examined: Only the syntypes, collected by E. Simon.

Distribution: Known only from Aragua, Venezuela.

Apopyllus now, new species
Figures 19-22
Types: Male holotype and female paratype from the south slope of Veeris Berg, Curaçao, Netherlands Antilles (December 20, 1962; H. W. Levi), deposited in MCZ.

Etymology: The specific name is an arbitrary combination of letters.

Diagnosis: The presence of a median longitudinal pale white stripe on the abdominal dorsum readily distinguishes this species from all others known. Males can also be distinguished from those of $A$. ivieorum by the more proximal cymbial incision and from those of A. silvestrii and $A$. iheringi by the shorter embolus, which does not extend as far proximally as in those species (figs. 19, 20). The


Figs. 19-22. Apopyllus now, new species. 19. Palp, ventral view. 20. Palp, retrolateral view. 21. Epigynum, ventral view. 22. Epigynum, dorsal view.
combination of a relatively narrow anterior epigynal ridge (fig. 21) and singly coiled anterior ducts (fig. 22) is diagnostic for females.

Male: Total length 2.63. Carapace 1.19 long, 0.94 wide. Femur II 0.82 long. Eye sizes and interdistances: AME 0.04, ALE 0.06, PME 0.04, PLE 0.06; AME-AME 0.04, AME-ALE 0.01, PME-PME 0.05, PME-PLE 0.03 , ALE-PLE 0.03. MOQ length 0.17, front width 0.12 , back width 0.13 . Proximal portion of embolus not far from proximal edge of tegulum (fig. 19); retrolateral cymbial incision relatively short (fig. 20). Leg spination: tibiae: II v0-2-0; IV r0-1-1; metatarsi: I v0-0-0; II vlp-0-0; IV v1p-2-2.

Female: Total length 5.04. Carapace 1.53 long, 1.22 wide. Femur II 1.01 long. Eye sizes and interdistances: AME 0.05, ALE 0.06, PME 0.05, PLE 0.07; AME-AME 0.05, AME-ALE 0.01, PME-PME 0.05, PME-PLE 0.04 , ALE-PLE 0.03. MOQ length 0.19 , front width 0.15 , back width 0.15 . Anterior epigynal ridge relatively narrow (fig. 21); anterior ducts with single coils (fig. 22). Leg spination: tibiae: I v0-0-0; II v0-1p-0; metatarsi: I v0-0-0; II vlp-0-0.

Material Examined: Only the types.

DISTRIBUTION: Known only from Curaçao.

## Apopyllus ivieorum, new species

Figures 15, 16
Type: Male holotype from 8 mi . west of Tehuantepec, Oaxaca, Mexico (August 29, 1966; J. and W. Ivie), deposited in AMNH.

Etymology: The specific name is a patronym in honor of the collectors of the holotype.

Diagnosis: The distally situated retrolateral cymbial incision (figs. 15, 16) is diagnostic.

Male: Total length 2.76. Carapace 1.22 long, 0.95 wide. Femur II 0.83 long. Eye sizes and interdistances: AME 0.04, ALE 0.06, PME 0.04, PLE 0.05; AME-AME 0.03, AME-ALE 0.01, PME-PME 0.05, PME-PLE 0.03 , ALE-PLE 0.02. MOQ length 0.12 , front width 0.11 , back width 0.13 . Retrolateral cymbial incision distally situated (fig. 15); tegular extension relatively small (fig. 16). Leg spination: femur IV r0-1-1; tibia I v1r-2-0; metatarsus III p0-2-2, v1p-2-2, r0-1-2.

Female: Unknown.
Material Examined: Only the holotype.

## Distribution: Known only from Oaxaca, Mexico.

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