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SPIDERS (Prodidomidae, Zodariidae and Symphytognathidae) IN HAWAII[1]

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Abstract: Two new species, *Prodidomus singulus* (Prodidomidae) and *Zodarium trispinosum* (Zodariidae), and the ♀ of *Pseudanapis aloha* Forster (Symphytognathidae) are described from the Hawaiian Islands.

Examination of leafmold from the island of Oahu by sifting and Berlese funnel techniques has revealed specimens of the families Prodidomidae, Zodariidae and Symphytognathidae. The specimens of Prodidomidae and Zodariidae are new species and represent the first records of these families for the Hawaiian Islands. The female of *Pseudanapis aloha* Forster (Symphytognathidae) is described for the first time and the male palp is illustrated.

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Genus **Prodidomus** Hentz, 1847

Prodidomus singulus Suman, new species Figs. 1-5.

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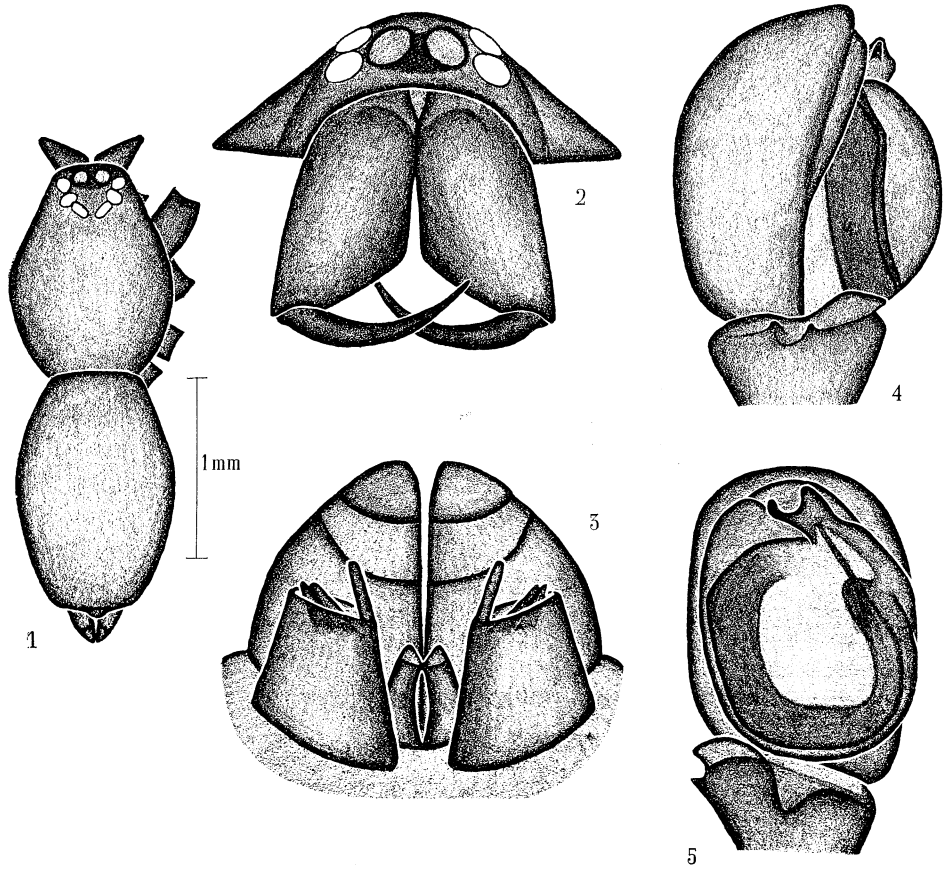
♂. *Measurements* (in mm)

Carapace, length 1.13; width 0.85; height 0.19
Abdomen, length 1.38; width 0.81; height 0.56

Leg	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
1	0.99	0.76	0.77	0.48	0.42	3.42
2	0.70	0.46	0.50	0.39	0.42	2.48
3	0.60	0.35	0.38	0.39	0.41	2.13
4	0.95	0.53	0.77	0.62	0.52	3.39
Palp	0.50	0.20	0.14	—	0.38	1.22

Carapace pale yellow brown, darker anteriorly; black around AME; abdomen pale yellow; appendages, sternum yellow brown; body surface smooth, moderately covered with hairs, abdomen more so. *Carapace* (fig. 1): from above—oval in outline, very slightly constricted in eye region, posterior margin recurved; from side—low, flat on top, slopes



Figs. 1–5. *Prodidomus singulus* Suman, n. sp.: 1, ♂, dorsal view; 2, ♂, anterior (face) view; 3, ♂, spinnerets, ventral view; 4, ♂, right palp, retrolateral view; 5, ♂, right palp, ventral view.

gradually down to posterior margin at 2/3 length from anterior end; clypeus slopes backwards. *Eyes* (fig. 1): 8, 2 rows; from above, anterior row slightly recurved, posterior row strongly procurved; eye group wider than long 30 : 20; AME dark, others pale; AME round, ALE subround, PME & PLE oval; ratio of AME : ALE : PME : PLE (greatest diameter) = 6 : 6 : 8 : 9; PME almost touching PLE, PME separated from each other by 2/6 diameter of AME, ALE separated from PLE and from AME by 1/6 diameter of AME, AME separated from each other by 3/6 their diameter; height of clypeus = 3/6 diameter of AME. *Chelicerae* (fig. 2): project slightly forward; slightly divergent; geniculate; fang more than 1/2 as long as basal segment; fang groove smooth, scopula along promargin. *Maxillae*: slightly convergent; longer than wide 21 : 16; triangular in outline with inner margin straight; palp insertion about midpoint of length; scopula on distal, inner margin. *Labium*: free; as wide as long; distal margin slightly rounded and with scopula. *Sternum*: oval; longer than wide 13 : 9; lateral margin with pointed projections to middle of base of each coxa; extends between coxae 4 and separates them by 9/16 width of a coxa. *Legs*: 1423; all legs densely covered with ciliated hairs; legs 1 & 4 more robust than legs 2 & 3; spines—1 disto-ventral on tibia and metatarsus of leg 4; trichobothria— 9–12 on all tibiae, 4–5 on all metatarsi; 4–6 on all tarsi; all tarsi with well developed claw tufts and 1 pair of smooth claws. *Palp* (figs. 4–5): embolus short; tibial processes retrolateral; patch of short brush-like hairs on tarsus. *Abdomen* (fig. 1): ovoid, anterior end truncated; 3 pairs of spinnerets (fig. 3), median pair very small and contiguous, anterior pair separated by about 1/2 their width and with 3 distal processes (fusuli), posterior pair the largest, contiguous and with distal segment about 1/2 as long as basal segment; anal tubercle short, conical; no colulus evident; tracheal spiracle (s) not found.

♀. Unknown.

Holotype ♂ (BISHOP 7009): Oahu, west slope of Puu Papaa peak, Kaneohe, ex leafmold, 22.XI.1964, Suman.

This species appears to be most closely related to *P. latebricola* Cooke described from Tanganyika, Africa, by Cooke (1964). The tibial processes of *singulus* are not as large as *latebricola*. The ventral process of *singulus* is short and pointed while that of *latebricola* is longer, curved and more rounded distally.

Genus **Zodarium** Walckenaer in Sav. & Aud., 1825

Zodarium trispinosum Suman, new species Figs. 6–10.

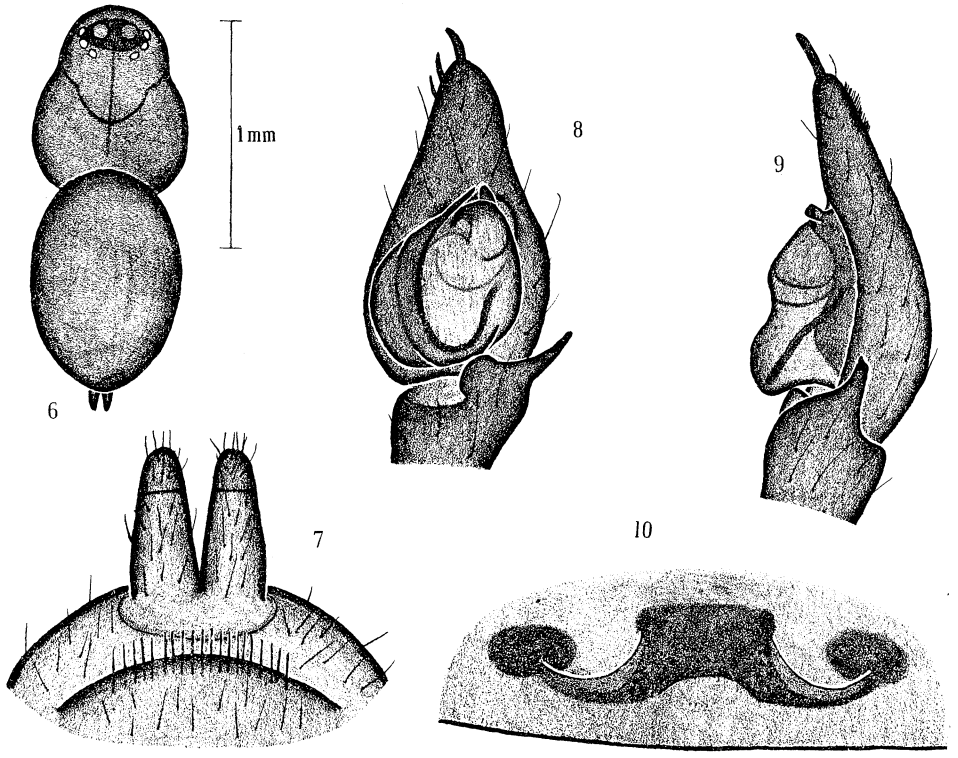
♂. *Measurements* (in mm)

Carapace, length 0.85; width 0.65; height 0.28

Abdomen, length 1.00; width 0.60; height 0.73

Leg	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
1	0.88	0.31	0.74	0.83	0.55	3.31
2	0.78	0.29	0.64	0.78	0.52	3.01
3	0.78	0.31	0.62	0.80	0.48	2.99
4	1.05	0.35	0.95	1.12	0.56	4.03
Palp			0.13	—	0.40	

Carapace pale yellow posteriorly, gradually darkening anteriorly; dark line separating cephalic from thoracic portion; black around AME; abdomen dark purple with indistinct chevrons on posterior 1/2; sternum, appendages yellow; body surface smooth, moderately covered with plumose hairs. *Carapace* (fig. 6): from above—broadly oval, constricted just posterior to eyes, anterior end rounded, posterior margin straight, thoracic furrow longitudinal, indistinct; from side—fairly level on top, drops sharply to posterior margin at about 2/3 length from anterior end, clypeus convex and slopes backward. *Eyes* (fig. 6): 8, 2 rows; from above—anterior row almost straight, posterior row strongly procurved; eye group wider than long 30 : 17; AME, round, dark; others subround, pale; ratio of AME : ALE : PME : PLE (greatest diameter)=8 : 5 : 4 : 5; AME separated from ALE by 1/8 and from each other by 3/8 diameter of AME; PLE separated from ALE by 1/8, from PME by 2/8 and from each other by 20/8 diameter of AME; PME separated from each other by 13/8 diameter of AME; clypeus height=10/8 diameter of AME. *Chelicerae*: vertical; no teeth on fang groove. *Maxillae*: convergent; longer than wide 22 : 9; sides subparallel; distal end rounded and with scopula; palp inserted at base. *Labium*: free; as wide as long; rounded distally; scopula on distal margin. *Sternum*: scutiform; about as wide as long; lateral margin with pointed projections extending to base of each coxa; posterior margin rounded, extends slightly between coxae 4 and se-



Figs. 6–10. *Zodarium trispinosum* Suman, n. sp.: 6, ♂, dorsal view; 7, ♂, spinnerets, ventral view; 8, ♂, left palp, ventral view; 9, ♂, left palp, retrolateral view; 10, ♀, epigynum, ventral view.

parates them by width of a coxa. *Legs*: 4123; all legs densely covered with ciliated hairs; spines—2 on prolateral surface of femora 1 & 2; trichobothria— 3 dorsal on all tibiae, 2 dorsal on all metatarsi, 2 dorsal on all tarsi; all tarsi with 3 claws, inferior claw smooth, superior claws with single row of 5-6 teeth; conspicuous slit sense organs on disto-dorsal surface of all metatarsi. *Palp* (figs. 8-9): cymbium with brush-like hairs on distal dorsal surface and 3 spine-like processes at distal end; tibia with retrolateral process. *Abdomen* (fig. 6): ovoid; transverse, sclerotized plate with transverse row of flattened hairs just anterior to spinnerets on venter; 1 pair of spinnerets evident (fig. 7); terminal segment short; no colulus; anal tubercle short, wide; spiracle (s) not evident (may be under plate).

♀. *Measurements* (in mm)

Carapace, length 0.79; width 0.60; height 0.29

Abdomen, length 1.06, width 0.71, height 0.65

Leg	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
1	0.71	0.27	0.59	0.67	0.53	2.77
2	0.66	0.27	0.52	0.64	0.48	2.57
3	0.66	0.27	0.50	0.66	0.43	2.52
4	0.87	0.29	0.77	0.87	0.53	3.33
Palp	0.28	0.13	0.17	—	0.25	0.83

Very similar to ♂; clypeus slightly higher than ♂; palp with 3 dorsal trichobothria on tibia and 1 dorsal on tarsus; single tarsal claw with row of 13 or 14 teeth on palp; epigynum (fig. 10) with 2 bursae copulatrix and 2 apparent external openings to them.

Holotype ♂ (BISHOP 7010): SE slope of Ulumawao peak, Kailua, Oahu, ex leafmold, 1.XI.1964, Suman. Allotopotype ♀ (BISHOP), same data. Specimens examined (BISHOP): 1♀, SW slope of Koko Head, Oahu, 60 m, 21.VIII.1965, G. A. Samuelson.

Genus **Pseudanapis** Simon, 1905

Pseudanapis aloha Forster, 1959, Trans. Roy. Soc. New Zealand **86** (3 & 4): 315 (Hawaii) Figs. 11-16.

♀. *Measurements* (in mm)

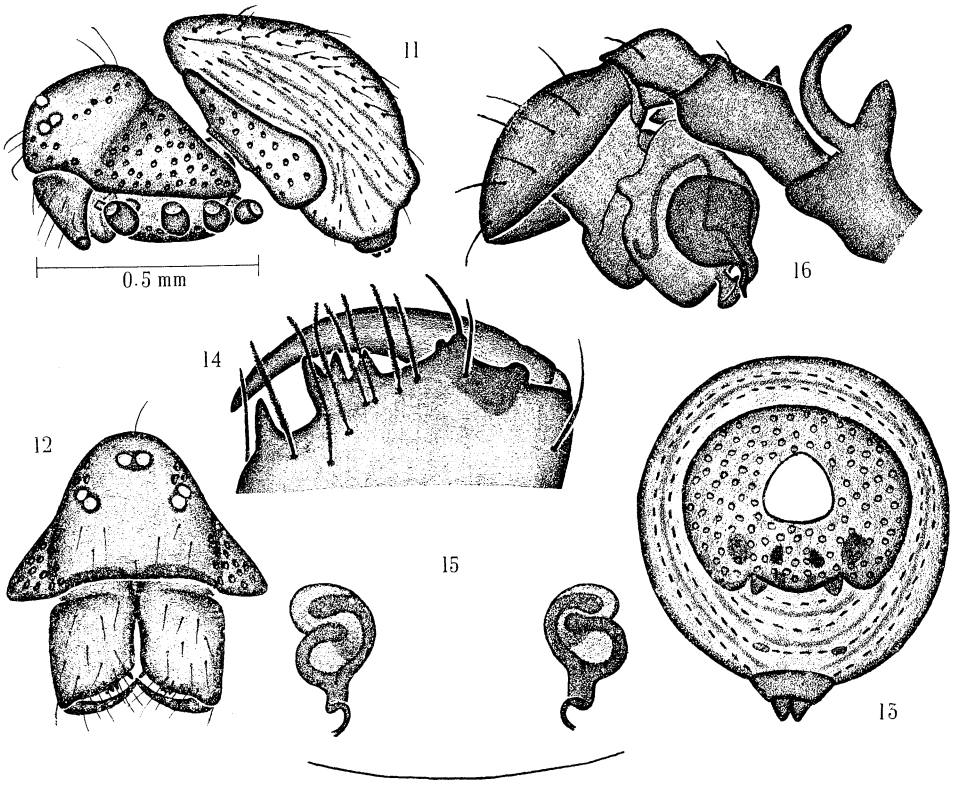
Carapace, length 0.49; width 0.37; height 0.26

Abdomen, length 0.68; width 0.60; height 0.44

Leg	Femur	Patella	Tibia	Metatarsus	Tarsus	Total
1	0.31	0.13	0.22	0.13	0.25	1.04
2	0.28	0.13	0.18	0.13	0.24	0.96
3	0.22	0.13	0.17	0.11	0.21	0.84
4	0.29	0.13	0.24	0.13	0.25	1.04
Palp	0.08	0.04	0.03	—	0.04	0.19

Carapace, sternum, mouthparts, abdominal plate yellow brown, legs paler; unsclerotized part of abdomen pale yellow. *Carapace* (fig. 11): from above-cephalic region narrower than thoracic region; sides of thoracic region rounded; from side— clypeus vertical, convex on top, slopes sharply to posterior margin about 1/2 length from anterior end; thoracic

region coarsely punctate laterally; shallow thoracic groove present. *Eyes* (fig. 12): 6 in 3 diads, all pale in color. *Chelicerae* (fig. 14): vertical; slightly geniculate; promargin with 3 contiguous teeth near base of fang and single tooth more distal; retromargin smooth; 7 ciliated hairs along promargin (8 recorded for ♂); fang evenly curved. *Maxillae*: converging strongly over labium; bluntly pointed distally; palp inserted on dorsal surface. *Labium*: fused to sternum; 2× as wide as long. *Sternum*: convex; coarsely punctate; completely sclerotized around coxae and fused to carapace; extends between coxae 4 and separates them by 2× width of a coxa. *Legs*: 1=4, 2, 3; all legs densely covered with smooth hairs (several serrated on ventral surface of tarsi); spines absent; trichobothria—3 (2-1) on dorsal surface of all tibiae, 1 mid-dorsal on metatarsi 1-3; 3 claws on tarsi, inferior claw small, curved, smooth. *Palp*: very small; all segments present; tarsal claw absent. *Abdomen* (figs. 11 & 13): ventral plate (coarsely punctate) well developed and extends around pedicel; longitudinal rows of small sclerotized plates laterally; 3 pairs of spinnerets and small colulus enclosed within well developed sclerotized ring; spiracles not evident. *Epigynum* (figs. 13 & 15): paired sperm receptacles internally; no external structures evident.



Figs. 11-16. *Pseudanapis aloha* Forster.: 11, ♀, lateral view; 12, ♀, anterior (face) view; 13, ♀, abdomen, ventral view; 14, ♀, right chelicera, prolateral view; 15, ♀, spermathecae, internal (dorsal) view; 16, ♂, right palp (partially expanded), retrolateral view.

♂. Similar to ♀; dorsal abdominal plate present; palp as in fig. 16.

Holotype ♂ (in American Museum of Natural History, New York): Hawaii (no other data). Specimens examined (BISHOP): Oahu I.: 3♀♀, Nursery, Makiki Hgts. Rd., Honolulu, ex leafmold, 19.VI.1964, Suman; 1♂, Univ. of Hawaii Manoa Campus, ex leafmold, 4.VII.1964, Suman; 3♀♀, Opeaula Val., Koolau Mts., ex moss, 6.VII.1964, Suman; 1♀, Keaiwa State Park, ex leafmold, 26. VII. 1964, Suman; 1♂, Kaoio Pt., ex leafmold, 14. XI. 1964, Suman; 1♀, Windward end of Pali Tunnel, ex leafmold, 24.IV.1965, Suman Hawaii Is.: 2♀♀, Panaowa Forest Res., ex leafmold, 26.XI.1960, G. E. Haas; 1♀, Hamakua Forest Res. (Kalopa Sec.), ex leafmold, 17.V.1963, Haas.

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