

SPIDERS OF THE FAMILY OONOPIDAE IN HAWAII¹

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Abstract: Eight new species of the family Oonopidae are described from the Hawaiian Islands. A key to the species is included.

There have been 5 species (4 unidentified) of the family Oonopidae recorded in Hawaii (Suman 1964), which were assigned to 4 different genera. These are: *Gamasomorpha loricata* (L. Koch) from Oahu, *Gamasomorpha* sp. from Kure, *Oonops* sp. from Oahu and Midway, *Opopaea* sp. from Oahu and *Scaphiella* sp. from an unknown locality. The specimens of these species, however, are either unavailable or in too poor condition for detailed study and more complete identification cannot be made.

Examination of leafmold from Oahu by sifting and Berlese funnel techniques has brought to light 8 new species. Future collecting on the other islands in the Hawaiian chain will probably increase the fauna further.

The 8 new species described in this paper do not appear to be closely related to each other and have been tentatively assigned to 6 widespread genera, including 3 of the 4 listed above. A generic revision is needed in the family Oonopidae. When this is done, different generic assignments of the Hawaiian species may be necessary.

Acknowledgments are extended to Drs R. R. Forster, J. L. Gressitt and L. W. Quate of Bishop Museum and to Dr D. E. Hardy of the University of Hawaii for their helpful criticisms in the preparation of this paper.

KEY TO HAWAIIAN OONOPIDAE

1. Abdomen with dorsal plate 2
 Abdomen without dorsal plate 6
2. Posterior eye row straight or slightly procurved..... 3
 Posterior eye row strongly recurved 4
3. PLE contiguous to PME: ALE almost contiguous to each other (fig 2)...**Ischnothyreus omus**
 PLE separated from PME: ALE separated by 2/3 diameter of an ALE (fig 10) ...
 **Opopaea lena**
4. Abdomen with pattern of purple patches (fig 15) **Scaphiella ula**
 Abdomen without pattern 5
5. Abdominal plates completely covering dorsal and ventral surfaces (fig 23).....
 **Gamasomorpha lalana**

1. This investigation was supported by a PHS grant (1 T1 A1 246-01) from the National Institute of Allergy and Infectious Diseases, National Institutes of Health.

- Abdominal plates not covering entire dorsal and ventral surfaces (fig 29)...**Triaeris lepus**
6. Abdomen with ventral plate posterior to epigastric groove; region anterior to groove sclerotized 7
 Abdomen without ventral plate posterior to epigastric groove; region anterior to groove not sclerotized **Oonopinus pihulus**
7. Leg 2 longer than leg 1..... **Oonopinus hunus**
 Leg 2 equal to leg 1..... **Oonopinus kilikus**

Genus **Ischnothyreus** Simon, 1893

Ischnothyreus omus Suman, n. sp. Figs. 1-8.

♂. *Measurements* (in mm)

Carapace, length 0.79; width 0.63; height 0.25.

Abdomen, length 0.84; width 0.44; height 0.53.

| Leg | Femur | Patella | Tibia | Metatarsus | Tarsus | Total |
|------|-------|---------|-------|------------|--------|-------|
| 1 | 0.59 | 0.25 | 0.49 | 0.43 | 0.27 | 2.03 |
| 2 | 0.56 | 0.25 | 0.46 | 0.45 | 0.27 | 1.99 |
| 3 | 0.52 | 0.24 | 0.34 | 0.42 | 0.28 | 1.80 |
| 4 | 0.73 | 0.36 | 0.57 | 0.63 | 0.34 | 2.63 |
| Palp | 0.06 | 0.08 | 0.10 | - | 0.22 | 0.46 |

Lateral part of carapace, dorsal plate on abdomen, dark green; carapace paler in middle with a pair of large brown patches behind eyes; black around eyes; ventral abdominal plates, non-sclerotized part of abdomen and sternum, pale yellow; legs yellow brown; palp reddish brown; body surface fairly smooth with few scattered hairs; legs moderately hairy. *Carapace* (fig 1): from above, broadly oval, narrowed in eye region, posterior margin straight; from side, strongly convex, depressed in eye region, highest point about 2/3 distance from anterior end. *Eyes* (fig 2): 6, all pale; eye group occupies about 3/4 width of head; posterior row straight; ratio of ALE: PLE: PME=7:7:7; PME contiguous to PLE and to each other; ALE separated from PME by 2/7, from PLE by 1/7 and from each other by 1/7 diameter of ALE; clypeus height=4/7 diameter of ALE. *Chelicerae* (fig 4): vertical; boss absent; double row of hairs beside promargin; promargin with 3 teeth; retromargin with single tooth; numerous denticles in groove; prominent process at base of fang. *Maxillae*: convergent; 2× as long as wide; scopula on distal and inner lateral margin. *Labium*: free; wider than long; scopula on distal margin. *Sternum*: scutiform; longer than wide; extends between coxae 4 and separates them by width of a coxa; lateral projections extend to base of each coxa; connected to carapace with narrow sclerotized strips between coxae. *Legs*: 4,1,2,3; spines- 2 prolateral (1, 1) on femur of leg 1, 1 prolateral on femur of leg 2, 4 pairs ventral on tibiae of legs 1 & 2, 2 pairs ventral on metatarsi of legs 1 & 2, none on legs 3 & 4; trichobothria- 3 dorsal (1, 2) on all tibiae, 1 sub-distal dorsal on all metatarsi; all tarsi with onychium, claws bipectinate. *Palp* (figs 5-7): spines absent; 2 dorsal trichobothria on tibia; entire palp very small and completely sclerotized; duct appears to run from distal end through all segments into cephalothorax; proximal end of tarsus with 2 projections. *Abdomen* (figs 1 & 3): ovoid; region anterior to epigastric groove and around pedicel sclerotized; small circular white spot bordered with bristles just anterior to groove; plate and posterior pair of spiracles just behind groove; dorsal plate narrower than width of abdomen and covers about 2/3 of dorsum; anterior

and posterior pairs of spinnerets slightly separated, subequal in length and thickness; median pair contiguous, thinner, shorter; colulus with 2 bristles on minute plate.

♀. *Measurements* (in mm)

Carapace, length 0.76; width 0.65; height 0.25.

Abdomen, length 1.19; width 0.70; height 0.76.

| Leg | Femur | Patella | Tibia | Metatarsus | Tarsus | Total |
|------|-------|---------|-------|------------|--------|-------|
| 1 | 0.64 | 0.29 | 0.59 | 0.49 | 0.27 | 2.28 |
| 2 | 0.62 | 0.29 | 0.53 | 0.49 | 0.27 | 2.20 |
| 3 | 0.57 | 0.27 | 0.39 | 0.46 | 0.28 | 1.97 |
| 4 | 0.78 | 0.39 | 0.63 | 0.67 | 0.32 | 2.79 |
| Palp | 0.20 | 0.13 | 0.15 | - | 0.29 | 0.77 |

Very similar in structure to ♂; carapace without pair of brown patches behind eyes; palp yellowish brown, 4 ventral (1,1,1,1) weak spines on femur, 3 dorsal (1,2) trichobothria, on tibia, tarsal claw absent; clypeus height shorter, =2/7 diameter of ALE; chelicerae with single tooth on both promargin and retromargin, numerous denticles in groove, process at base of fang absent; no white spot just anterior to epigastric groove as in ♂; dorsal plate on abdomen proportionately smaller than on ♂; structure of epigastric region as in fig 8.

Holotype ♂ (BISHOP 3736), SE slope of Ulumawao peak, Kailua, Oahu, ex leafmold, 8.XI.1964, Suman. Allotype ♀ (BISHOP), same data. Paratypes (BISHOP): ♂, ♀, same data. SPECIMENS EXAMINED (BISHOP): ♂, Kalihi Valley, Oahu, ex leafmold, 4.III.1964, Y. Miyatake; ♀, Makiki Heights Rd, Honolulu, Oahu, ex leafmold, 19.VI.1964, Suman; ♂, slope of Mt Tantalus, Oahu, ex Bamboo leafmold, 12.VIII.1964, Suman; ♀, near Kahana Bay, Oahu, ex leafmold, 14.XI.1964, Suman; 2♀♀, Waimanalo pali behind Waimanalo, Oahu, ex leafmold, 15.XI.1964, Suman.

This species appears to be closely related to *I. lanutoo* Marples described from Samoa and *I. pacificus* Roewer described from Micronesia. The ♂ of *lanutoo* is unknown. The ♀ of *I. omus* differs from the ♀ of *lanutoo* by its smaller size, having 3 dorsal trichobothria instead of 2 on the tibiae of legs 1 & 2 and by lacking a superimposed procurved crescent over the genital opening. *I. omus* differs from *pacificus* by the structure of the ♂ palp. The distal tip of the bulb of *omus* is much shorter and thicker and the femur of the palp is shorter than the tibia, while the reverse is true as figured for *pacificus*.

Genus *Opopaea* Simon, 1891

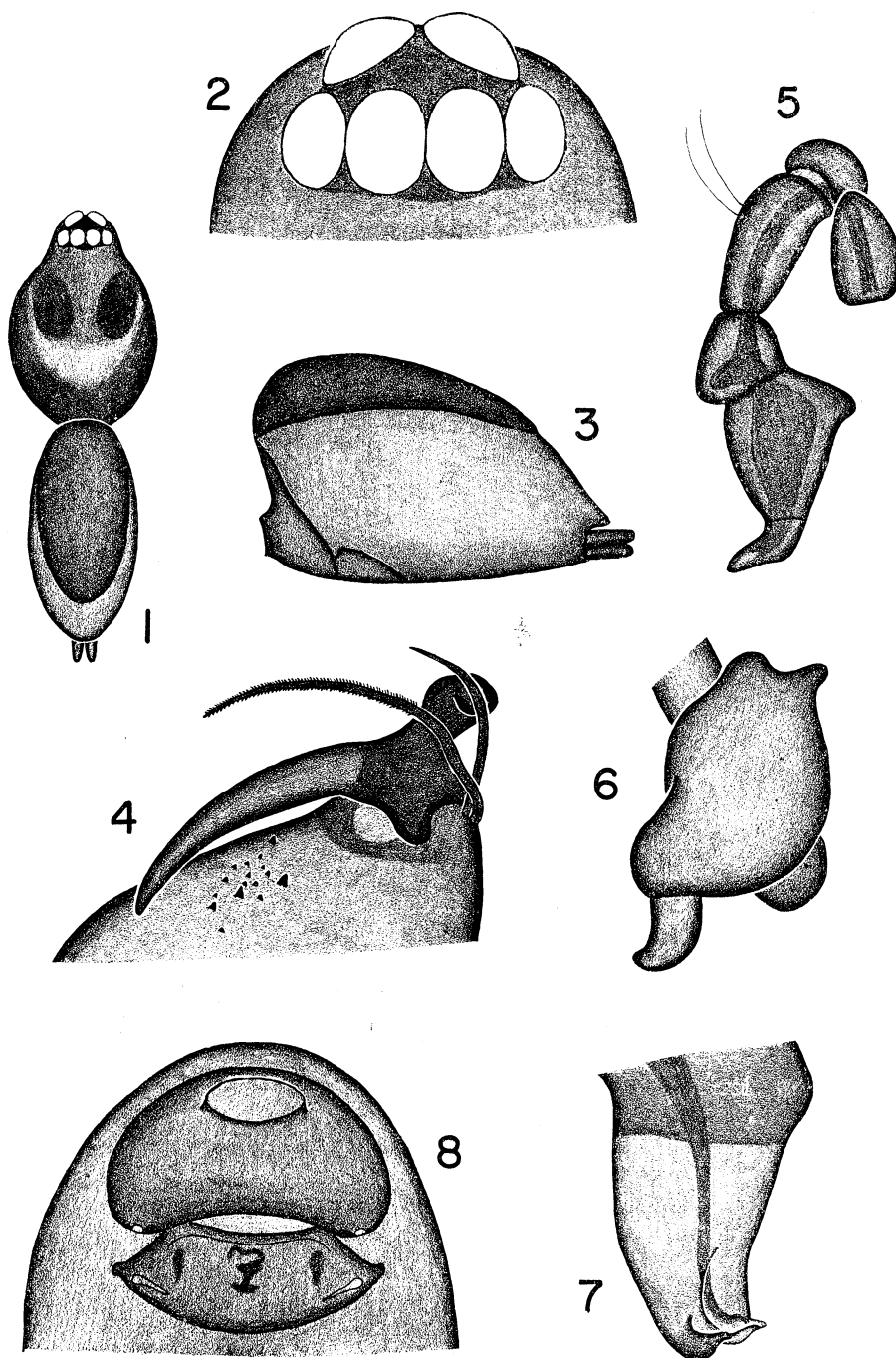
Opopaea lena Suman, n. sp. Figs. 9-14.

♂. *Measurements* (in mm)

Carapace, length 0.54; width 0.44; height 0.19.

Abdomen, length 0.70; width 0.43; height 0.33.

| Leg | Femur | Patella | Tibia | Metatarsus | Tarsus | Total |
|------|-------|---------|-------|------------|--------|-------|
| 1 | 0.36 | 0.21 | 0.22 | 0.22 | 0.15 | 1.16 |
| 2 | 0.32 | 0.17 | 0.20 | 0.21 | 0.15 | 1.05 |
| 3 | 0.27 | 0.13 | 0.15 | 0.18 | 0.13 | 0.86 |
| 4 | 0.41 | 0.21 | 0.29 | 0.27 | 0.17 | 1.35 |
| Palp | 0.10 | 0.22 | 0.07 | - | 0.22 | 0.61 |



Figs. 1-8. *Ischnothyreus omus* Suman, n. sp. 1, ♂, dorsal view; 2, ♂ eye group, dorsal view; 3, ♂ abdomen, lateral view; 4, ♂ chelicera, prolateral view; 5, ♂ palp, retrolateral view; 6, ♂ tarsus of palp, distal view; 7, tip of ♂ palp, prolateral view; 8, ♀ epigastric region.

Carapace, abdominal plates, appendages, dark yellow; coxae, sternum, paler; non-sclerotized part of abdomen, almost white; large black patch on posterodorsal surface of abdomen; black around eyes; body surface finely punctate, with few scattered hairs; legs moderately hairy. *Carapace* (fig 9): from above, oval, slightly narrowed in eye region, posterior margin recurved; from side, fairly level, drops sharply to posterior margin at about 3/4 distance from anterior end. *Eyes* (fig 10): 6, all pale; eye group occupies slightly more than 1/2 width of head; posterior row slightly procurved; ratio of ALE : PLE : PME = 3 : 3 : 3; PME almost contiguous; ALE separated from PME by 2/3, from PLE by 1/3 and from each other by 2/3 diameter of ALE; PLE separated from PME by 1/3 diameter of ALE; clypeus height = 6/3 diameter of ALE. *Chelicerae*: vertical; boss absent; double row of hairs beside promargin; teeth and denticles lacking. *Maxillae*: convergent; slightly more than 2× as long as wide; scopula on distal and inner lateral margins; prominent process on distal ventral surface. *Labium*: free; wider than long; scopula on distal margin. *Sternum*: scutiform; longer than wide; extends between coxae 4 and separates them by width of a coxa; shallow narrow grooves extend inward from coxae; completely sclerotized around coxae and fused to carapace. *Legs*: 4, 1, 2, 3; spines lacking; trichobothria-3 dorsal (1, 2) on all tibiae, 1 sub-distal dorsal on all metatarsi; all tarsi with onychium, claws bipectinate. *Palp* (figs 12-13): spines absent; 2 dorsal trichobothria on tibia; tarsus with large process extending backward on prolateral proximal end; tarsus and bulb fused; femur extremely large. *Abdomen* (figs 9 & 11): ovoid, slightly flattened dorso-ventrally; plates completely covering dorsal and ventral surfaces; posterior pair of spiracles just behind epigastric groove; narrow sclerotized band with single row of bristles extending ventrally and laterally around spinnerets; 3 pairs of spinnerets subequal in length, anterior pair thickest and slightly separated, median pair thinnest; colulus with 2 bristles.

♀. *Measurements* (in mm)

Carapace, length 0.59; width 0.41; height 0.16.

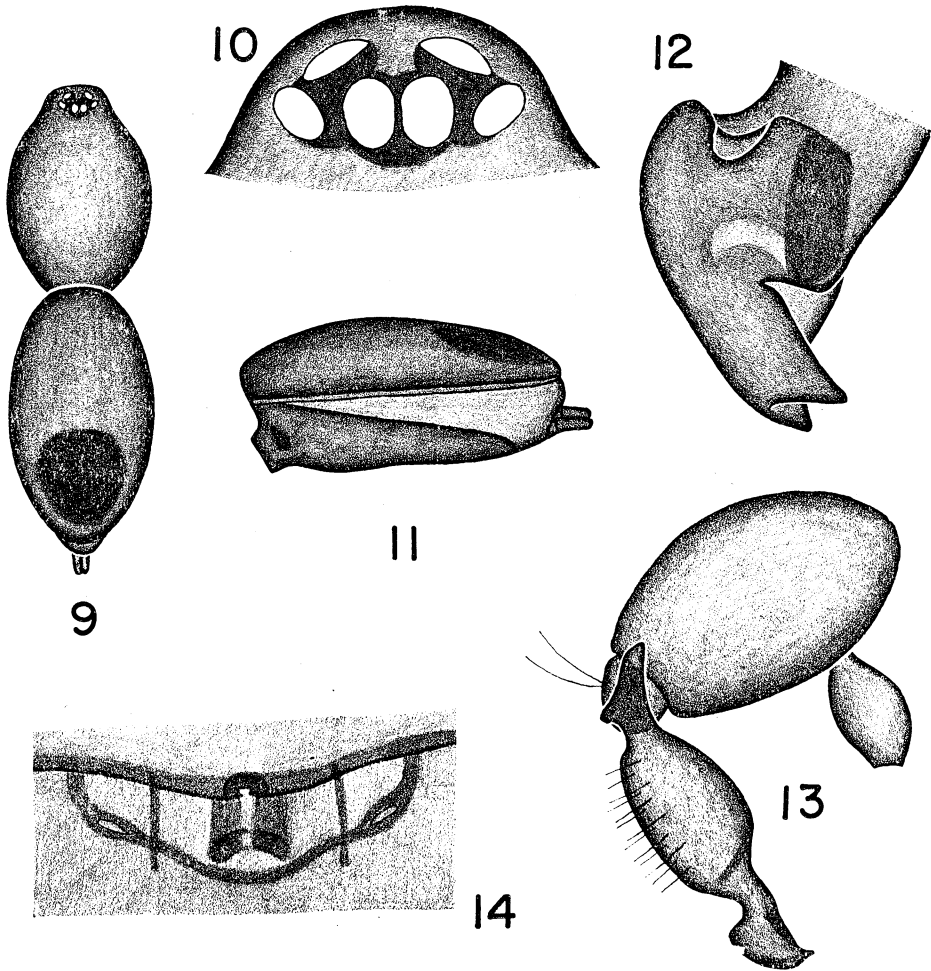
Abdomen, length 0.76; width 0.50; height 0.33.

| Leg | Femur | Patella | Tibia | Metatarsus | Tarsus | Total |
|------|-------|---------|-------|------------|--------|-------|
| 1 | 0.39 | 0.20 | 0.24 | 0.24 | 0.14 | 1.21 |
| 2 | 0.34 | 0.20 | 0.22 | 0.22 | 0.14 | 1.12 |
| 3 | 0.28 | 0.14 | 0.17 | 0.18 | 0.13 | 0.90 |
| 4 | 0.41 | 0.22 | 0.31 | 0.28 | 0.17 | 1.39 |
| Palp | 0.13 | 0.10 | 0.07 | - | 0.13 | 0.43 |

Very similar to ♂ in structure; clypeus height shorter, 5/3 diameter of ALE; maxillae without prominent process on disto-ventral surface; tarsus of palp without claw; structure of epigastric region as in fig 14.

Holotype ♂ (BISHOP 3737), SE slope of Ulumawao peak, Kailua, Oahu, ex leafmold, 8. XI. 1964, Suman. Allotype ♀ (BISHOP), same data, 1. XI. 1964. Paratypes (BISHOP): 4♂♂, 4♀♀, West slope of Puu Papaa peak, Kaneohe, Oahu, ex leafmold, 22. XI. 1964, Suman. SPECIMENS EXAMINED (BISHOP): ♂, Punahou Park, Honolulu, Oahu, ex Bamboo leafmold, 23. VI. 1964, Suman; ♂, near Wawamalu Beach, Koko Head region, Oahu, ex leafmold, 3. VII. 1964, Suman; 2♂♂, 4♀♀, Waimanalo pali above Sea Life Park, Oahu, ex leafmold, 15. XI. 1964, Suman.

This species appears to be most closely related to *O. foveolata* Roewer described from Micronesia. *O. lena* differs from *foveolata* by the structure of the ♂ palp. The tarsus



Figs. 9-14. *Opopaea lena* Suman, n. sp. 9, ♂, dorsal view; 10, ♂ eye group, dorsal view; 11, ♂ abdomen, lateral view; 12, tip of ♂ palp, prolateral view; 13, ♂ palp, prolateral view; 14, ♀ epigastric region.

and metatarsus are fused in *lena* rather than free and there is a large process on the proximal end of the metatarsus which is absent in *foveolata*.

Genus *Scaphiella* Simon, 1891

Scaphiella ula Suman, n. sp. Figs. 15-20.

♂. *Measurements* (in mm)

Carapace, length 0.69; width 0.56; height 0.23.

Abdomen, length 0.93; width 0.53; height 0.56.

| Leg | Femur | Patella | Tibia | Metatarsus | Tarsus | Total |
|------|-------|---------|-------|------------|--------|-------|
| 1 | 0.57 | 0.27 | 0.45 | 0.46 | 0.34 | 2.09 |
| 2 | 0.52 | 0.24 | 0.36 | 0.39 | 0.29 | 1.80 |
| 3 | 0.48 | 0.22 | 0.34 | 0.41 | 0.29 | 1.74 |
| 4 | 0.62 | 0.28 | 0.49 | 0.57 | 0.32 | 2.28 |
| Palp | 0.20 | 0.13 | 0.10 | - | 0.25 | 0.68 |

Carapace, appendages, yellow; coxae, sternum, paler; abdominal plates yellow orange; non-sclerotized part of abdomen pale yellow with scattered patches of purple; black around eyes; body surface smooth with few scattered hairs; legs moderately hairy. *Carapace* (fig 15): from above, broadly oval, narrowed in eye region, posterior margin recurved; from side, slopes up gradually from anterior margin then drops sharply to posterior margin at 3/5 of length. *Eyes* (fig 16): 6, all pale; eye group occupies about 3/4 width of head; posterior row recurved, ALE-PME row more strongly procurved; ratio of ALE : PLE : PME=5 : 5 : 5; PME almost contiguous; ALE separated from PME by 1/5, from PLE by 1/5 and from each other by 5/5 diameter of ALE : PLE separated from PME by 2/5 diameter of ALE; clypeus height=4/5 diameter of ALE. *Cheliceræ*: vertical; boss absent; double row of hairs beside promargin; teeth lacking, numerous denticles present in groove. *Maxillae*: convergent, 2X as long as wide; scopula on distal and inner lateral margins. *Labium*: free; wider than long; scopula on distal margin. *Sternum*: scutiform; as wide as long; extends between coxae 4 and separates them by width of a coxa; anterior end with transverse depression; lateral projections extend to base of each coxa; connected to carapace with narrow sclerotized strips between coxae. *Legs*: 4, 1, 2, 3; spines absent; trichobothria- 3 dorsal (1, 2) on all tibiae, 1 sub-distal dorsal on all metatarsi; all tarsi with onychium, claws bipectinate. *Palp* (figs 18-19): spines absent; 3 dorsal (2, 1) trichobothria on tibia; bulb not fused to tarsus; embolus is long, slightly curved extension of central part of bulb; spine-like process parallel to long axis of embolus. *Abdomen* (figs. 15 & 17): ovoid; region anterior to epigastric groove and around pedicel sclerotized; large plate and posterior pair of spiracles just behind groove; dorsal plate covers most of dorsum; narrow sclerotized band with single row of bristles extends ventrally and laterally around spinnerets; anterior and posterior pairs of spinnerets subequal in length and thickness, median pair shorter and thinner; colulus with 2 bristles.

♀. *Measurements* (in mm)

Carapace, length 0.69; width 0.53; height 0.25.

Abdomen, length 1.10; width 0.61; height 0.70.

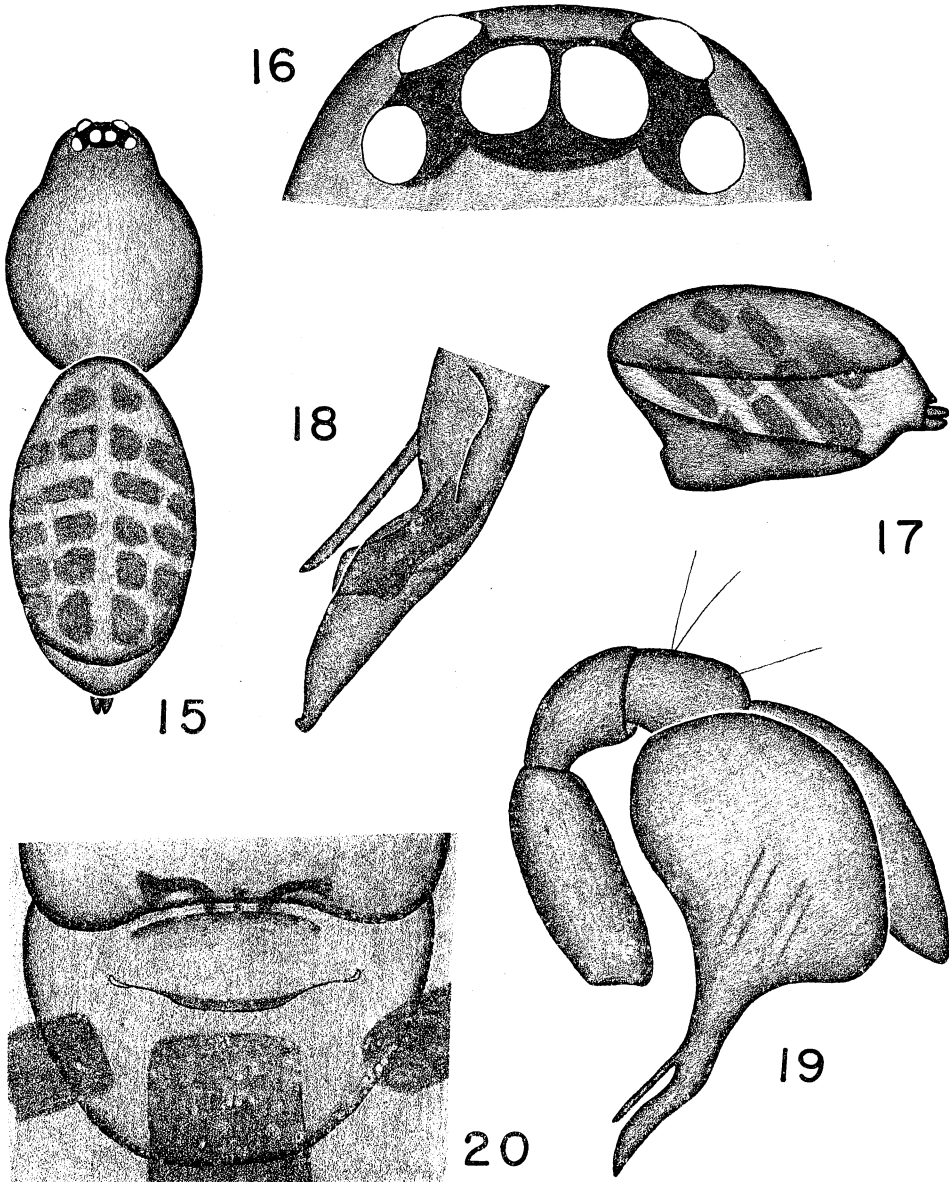
| Leg | Femur | Patella | Tibia | Metatarsus | Tarsus | Total |
|------|-------|---------|-------|------------|--------|-------|
| 1 | 0.63 | 0.28 | 0.46 | 0.48 | 0.34 | 2.19 |
| 2 | 0.52 | 0.25 | 0.38 | 0.42 | 0.32 | 1.89 |
| 3 | 0.50 | 0.25 | 0.35 | 0.42 | 0.31 | 1.83 |
| 4 | 0.66 | 0.31 | 0.52 | 0.60 | 0.34 | 2.43 |
| Palp | 0.20 | 0.13 | 0.11 | - | 0.17 | 0.61 |

Very similar to ♂ in structure; tarsus of palp without claw; structure of epigastric region as in fig 20.

Holotype ♂ (BISHOP 3738), West slope of Puu Papaa peak, Kaneohe, Oahu, ex leafmold, 22.XI.1964, Suman. Allotype ♀ (BISHOP), same data.

This species is tentatively assigned to the genus *Scaphiella* because of the presence of

dorsal and ventral abdominal plates and the lack of leg spines. It differs significantly from the genotype *S. cymbalaria* Simon however, by the arrangement of the eyes. The AME of *S. ula* are not the largest and are widely separated rather than subcontiguous. The posterior eyes are not contiguous and form a recurved line rather than procurved.



Figs. 15-20. *Scaphiella ula* Suman, n. sp. 15, ♂, dorsal view; 16, ♂ eye group, dorsal view; 17, ♂ abdomen, lateral view; 18, tip of ♂ palp, prolateral view; 19, ♂ palp, retrolateral view; 20, ♀ epigastric region.

Bridwell (1920) reported a mite-like spider with chitinous plates above and below as probably belonging to the genus *Scaphiella*. It is not certain however whether this specimen belongs to the species described above.

Genus *Gamasomorpha* Karsch, 1881

Gamasomorpha lalana Suman, n. sp. Figs. 21-26.

♂. *Measurements* (in mm)

Carapace, length 0.96; width 0.75; height 0.39.

Abdomen, length 1.39; width 0.93; height 0.69.

| Leg | Femur | Patella | Tibia | Metatarsus | Tarsus | Total |
|------|-------|---------|-------|------------|--------|-------|
| 1 | 0.66 | 0.34 | 0.45 | 0.43 | 0.25 | 2.13 |
| 2 | 0.64 | 0.35 | 0.43 | 0.43 | 0.25 | 2.10 |
| 3 | 0.60 | 0.32 | 0.38 | 0.39 | 0.25 | 1.94 |
| 4 | 0.71 | 0.39 | 0.50 | 0.52 | 0.27 | 2.39 |
| Palp | 0.24 | 0.17 | 0.11 | - | 0.49 | 1.01 |

Cephalothorax, abdominal plates, dark red; appendages paler; nonsclerotized part of abdomen pale yellow; not black around eyes; body surface coarsely punctate with few scattered hairs; legs moderately hairy. *Carapace* (fig 21): from above, broadly oval, narrowed in eye region; posterior margin recurved; from side, slopes up gradually from anterior margin then drops sharply to posterior margin at 5/8 of length. *Eyes* (fig 22): 6, all pale; eye group occupies about 7/8 width of head; posterior row strongly recurved, ALE-PME row more strongly procurved; ratio of ALE : PLE : PME=9 : 8 : 8; PME contiguous; ALE separated from PME by 1/9, from PLE by 1/9 and from each other by 8/9 diameter of ALE; PLE separated from PME by 2/9 diameter of ALE; clypeus height=7/9 diameter of ALE. *Chelicerae*: vertical; boss absent; double row of hairs beside promargin; teeth and denticles lacking. *Maxillae*: slightly convergent; 2× as long as wide; scopula on distal and inner lateral margins. *Labium*: fused; as wide as long; scopula on distal margin. *Sternum*: scutiform; as wide as long; extends between coxae 4 and separates them by slightly more than width of a coxa; anterior end with transverse depression; wide shallow grooves extend inward from between coxae; completely sclerotized around coxae and fused to carapace. *Legs*: 4, 1, 2, 3; spines absent; trichobothria-3 dorsal (1, 2) on all tibiae, 1 subdistal dorsal on all metatarsi; all tarsi with onychium, claws bipectinate. *Palp* (figs 24-25): spines absent; 1 dorsal trichobothrium on tibia; bulb not fused to tarsus; distal end of bulb drawn out into 2 long processes; distal tip of longest process bifurcate with 1 part twisted over the other. *Abdomen* (figs 21 & 23): ovoid; slightly flattened dorso-ventrally; plates cover entire dorsal and ventral surfaces; posterior pair of spiracles just behind epigastric groove; wide sclerotized band running ventrally and laterally around spinnerets; anterior pair of spinnerets larger than other 2 pairs and separated by 1/2 their width, posterior and median pairs subequal in length and contiguous, median pair thinnest; colulus with 2 bristles on minute plate.

♀. *Measurements* (in mm)

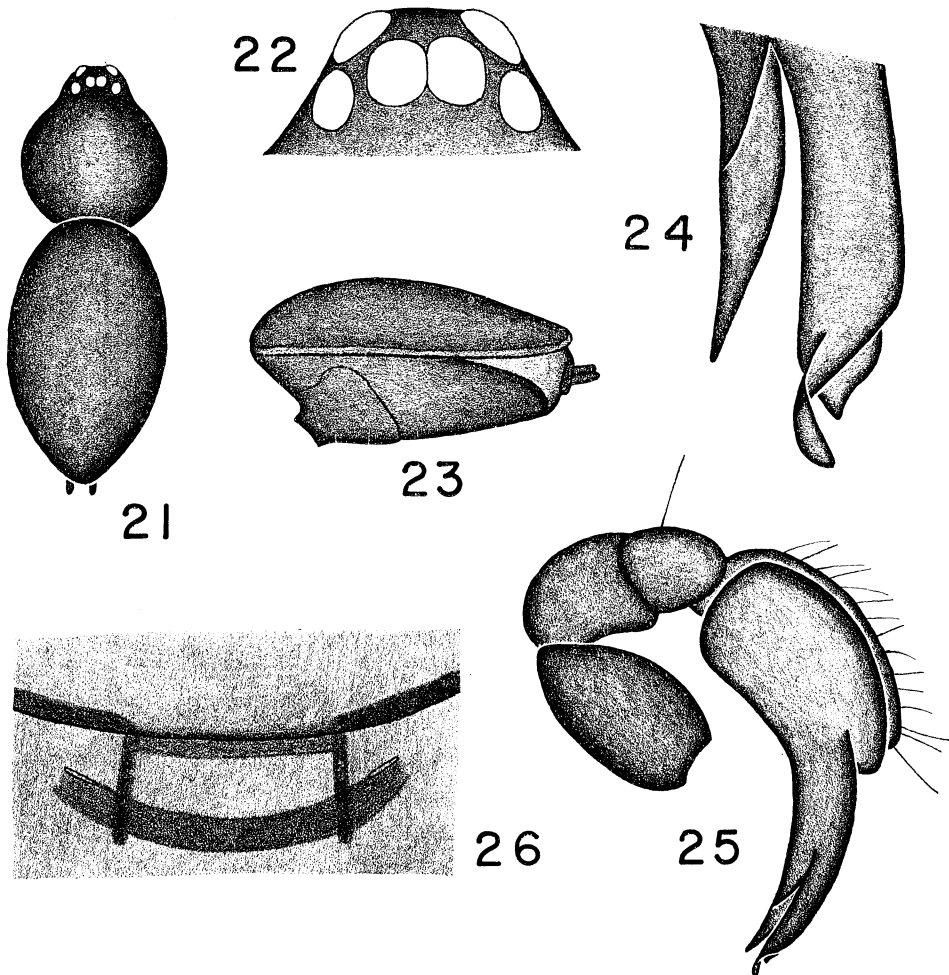
Carapace, length 1.03; width 0.81; height 0.40.

Abdomen, length 1.88; width 1.25; height 0.91.

| Leg | Femur | Patella | Tibia | Metatarsus | Tarsus | Total |
|------|-------|---------|-------|------------|--------|-------|
| 1 | 0.70 | 0.36 | 0.48 | 0.46 | 0.27 | 2.27 |
| 2 | 0.73 | 0.38 | 0.49 | 0.48 | 0.28 | 2.36 |
| 3 | 0.70 | 0.36 | 0.39 | 0.43 | 0.25 | 2.13 |
| 4 | 0.80 | 0.43 | 0.56 | 0.57 | 0.27 | 2.63 |
| Palp | 0.29 | 0.15 | 0.15 | - | 0.31 | 0.90 |

Very similar in structure to ♂; palp with 2 dorsal (1, 1) trichobothria on tibia, spines and tarsal claw absent; structure of epigastric region as in fig. 26.

Holotype ♂ (BISHOP 3739), SE slope of Ulumawao peak, Kailua, Oahu, ex leafmold, 1. XI. 1964, Suman. Allotype ♀ (BISHOP), same data. SPECIMENS EXAMINED (BISHOP): 2♂♂,



Figs. 21-26. *Gamasomorpha lalana* Suman, n. sp. 21, ♂, dorsal view; 22, ♂ eye group, dorsal view; 23, ♂ abdomen, lateral view; 24, tip of ♂ palp, retrolateral view; 25, ♂ palp, retrolateral view; 26, ♀ epigastric region.

Puu Park, Tantalus, Oahu, ex leafmold, 27.VI.1964, Suman; ♀, valley just west of Valley of Temples Cemetery, sweeping open field vegetation, 14. XI. 1964, Suman.

This species appears to be related to *G. loricata* (L. Koch) described from Samoa and *G. minima* Berland described from the Phoenix Is. *G. lalana* differs from these by the structure of the ♂ palp. The distal tip of the bulb of *lalana* differs from that of *loricata*, figured by Berland (1935), by the tip of the longer process not being as deeply bifurcate and having 1 part of the tip twisted over the other part. *G. lalana* differs from *minima* by the prolongation of the bulb being distal rather than central and by lacking a stylus at the tip of the prolongation.

Genus *Triaeris* Simon, 1891

Triaeris lepus Suman, n. sp. Figs. 27-31.

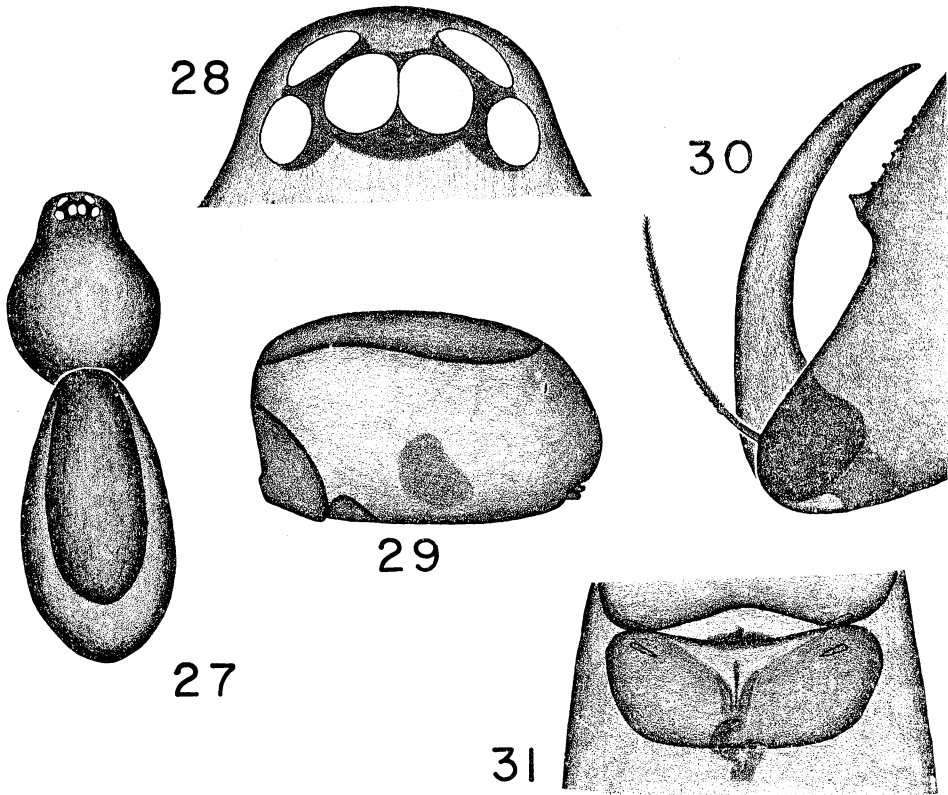
♀. *Measurements* (in mm)

Carapace, length 0.70; width 0.56; height 0.25.

Abdomen, length 1.10; width 0.60; height 0.64.

| Leg | Femur | Patella | Tibia | Metatarsus | Tarsus | Total |
|------|-------|---------|-------|------------|--------|-------|
| 1 | 0.53 | 0.36 | 0.39 | 0.34 | 0.20 | 1.82 |
| 2 | 0.46 | 0.29 | 0.34 | 0.32 | 0.20 | 1.61 |
| 3 | 0.41 | 0.22 | 0.24 | 0.31 | 0.20 | 1.38 |
| 4 | 0.59 | 0.34 | 0.43 | 0.49 | 0.24 | 2.09 |
| Palp | 0.20 | 0.14 | 0.13 | - | 0.21 | 0.68 |

Cephalothorax, abdominal plates, appendages, yellow orange; non-sclerotized part of abdomen pale yellow; 1 large, pale green, patch on each side of abdomen; black around eyes; body surface smooth with few scattered hairs; legs moderately hairy. *Carapace* (fig 27): from above, broadly oval, narrowed in eye region, posterior margin straight; from side, fairly level, drops sharply to posterior margin at 2/3 distance from anterior end. *Eyes* (fig 28): 6, all pale; eye group occupies about 4/5 width of head; posterior row strongly recurved, ALE-PME row more strongly procurved; ratio of ALE : PLE : PME = 5 : 5 : 5; PME contiguous; ALE separated from PME by 1/5, from PLE by 1/5 and from each other by 5/5 diameter of ALE; PLE separated from PME by 1/5 diameter of ALE; clypeus height = 2/5 diameter of ALE. *Chelicerae* (fig 30): vertical; boss absent; double row of hairs beside promargin; 1 large tooth, numerous denticles in groove. *Maxillae*: convergent; 2× as long as wide; scopula on distal and inner lateral margins. *Labium*: free; wider than long; scopula on distal margin. *Sternum*: scutiform; longer than wide; extends between coxae 4 and separates them by width of a coxa; lateral projections extend to base of each coxa; completely sclerotized around coxae and fused to carapace. *Legs*: 4, 1, 2, 3; spines- 2 pairs ventral on patella of leg 1, 3 pairs ventral on tibia of leg 1, 1 ventral on patella of leg 2, 2 ventral (1, 1) on tibia of leg 2, 1 distal ventral on tibia of leg 4, spines absent on leg 3; trichobothria- 3 dorsal (1, 2) on all tibiae, 1 sub-distal dorsal on all metatarsi; all tarsi with onychium, claws bipectinate. *Palp*: spines absent; 3 dorsal (1, 2) trichobothria on tibia; tarsal claw absent. *Abdomen* (figs 27, 29 & 31): ovoid; structure of epigastric region as in fig 31; region anterior to epigastric groove and around pedicel sclerotized; plate and posterior pair of spiracles just behind groove; dorsal plate covers about 3/4 of dorsum; sclerotized ring with single row of bristles extending ventrally and



Figs. 27-31. *Triaeris lepus* Suman, n. sp. 27, ♀, dorsal view; 28, ♀ eye group, dorsal view; 29, ♀ abdomen, lateral view; 30, ♀ chelicera, prolateral view; 31, ♀ epigastric region.

laterally around spinnerets; 3 pairs of spinnerets subequal in length, anterior and posterior pairs slightly separated, median pair contiguous and thinnest; colulus with 2 bristles on minute plate.

Holotype ♀ (BISHOP 3740), west slope of Puu Papaa peak, Kaneohe, Oahu, ex leafmold, 22. XI. 1964, Suman. Paratypes (BISHOP): 2 ♀♀, west slope of Puu Papaa peak, Kaneohe, Oahu, ex leafmold, 22. XI. 1964, Suman. ♂ unknown.

This species appears to be most closely related to *T. patellaris* Bryant described from Cuba. It differs from *patellaris* by the PLE being equal in diameter to the PME instead of half their diameter and in the markings of the epigynum. *T. lepus* does not have the 2 large round spots on the plate posterior to the epigastric groove.

Genus *Oonopinus* Simon, 1893

The following 3 species, *pihulus*, *hunas*, and *kilikus* share the characters of similar eye arrangements, spines on at least some of the legs and the absence of dorsal abdominal plates. They are placed tentatively in the genus *Oonopinus* because of the apparent close relationship of *O. kilikus* to *O. pruvotae* Berland described from New Caledonia.

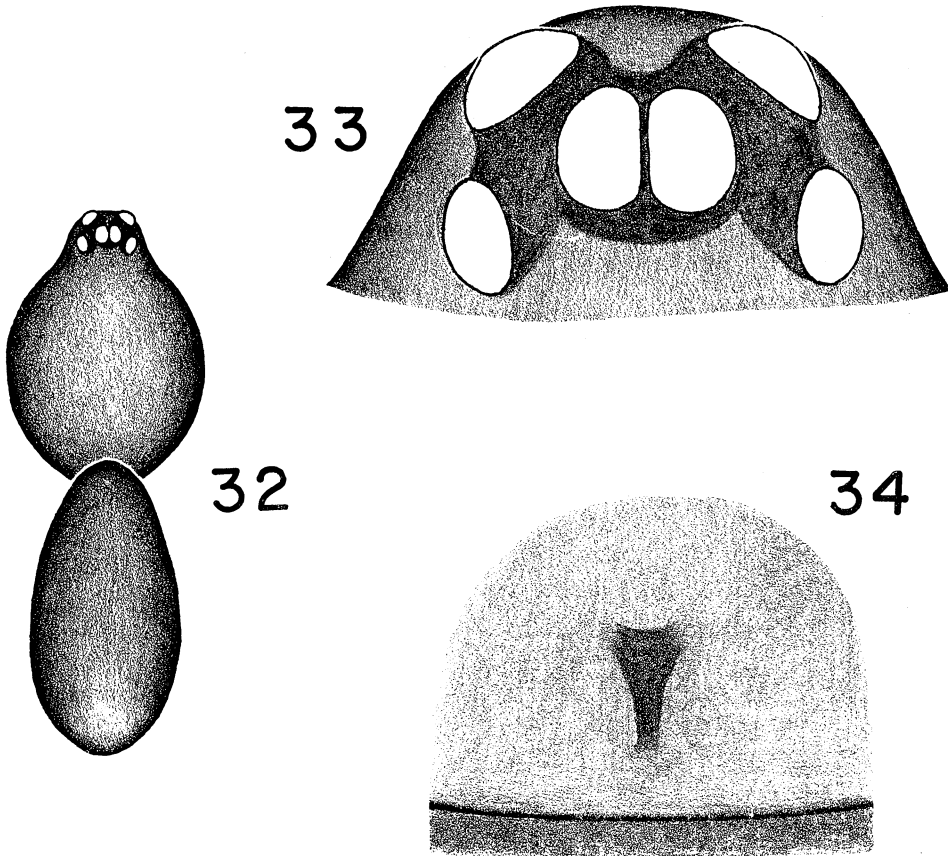
Oonopinus pihulus Suman, n. sp. Figs. 32-34.♀. *Measurements* (in mm)

Carapace, length 0.71; width 0.56; height 0.31.

Abdomen, length 0.81; width 0.46; height 0.43.

| Leg | Femur | Patella | Tibia | Metatarsus | Tarsus | Total |
|------|-------|---------|-------|------------|--------|-------|
| 1 | 0.57 | 0.31 | 0.45 | 0.42 | 0.24 | 1.99 |
| 2 | 0.59 | 0.31 | 0.45 | 0.42 | 0.22 | 1.99 |
| 3 | 0.55 | 0.25 | 0.34 | 0.36 | 0.20 | 1.70 |
| 4 | 0.69 | 0.46 | 0.56 | 0.57 | 0.22 | 2.50 |
| Palp | 0.21 | 0.13 | 0.14 | - | 0.24 | 0.72 |

Cephalothorax, appendages pale yellow; black around eyes; abdomen brown with pale spot just above spinnerets; region anterior to epigastric groove pale; body surface smooth, very hairy; legs very hairy. *Carapace* (fig 32): from above, broadly oval, narrowed in eye region, posterior margin straight; from side, slopes up gradually from anterior end



Figs. 32-34. *Oonopinus pihulus* Suman, n. sp. 32, ♀, dorsal view; 33, ♀ eye group, dorsal view; 34, ♀ epigastric region.

then drops sharply to posterior margin at 2/3 of length. *Eyes* (fig 33): 6, all pale; eye group occupies about 3/4 width of head; posterior row strongly recurved; ALE-PME row more strongly procurved; ratio of ALE : PLE : PME=6 : 6 : 6; PME almost contiguous; ALE separated from PME by 2/6, from PLE by 1/6 and from each other by 5/6 diameter of ALE; PLE separated from PME by 2/6 diameter of ALE; clypeus height=1/6 diameter of ALE. *Chelicerae*: vertical; boss absent; double row of hairs beside promargin; teeth and denticles lacking. *Maxillae*: convergent; about 2.5× as long as wide; scopula on distal and inner lateral margins. *Labium*: free; wider than long; scopula on distal margin. *Sternum*: scutiform; longer than wide; extends between coxae 4 and separates them by 2/3 width of a coxa; lateral projections to base of coxae and sclerotized connections to carapace absent. *Legs* 4, 1-2, 3; spines (weak) scattered on tibiae and metatarsi of legs 3 & 4; trichobothria- 3 dorsal (1, 2) on all tibiae, 1 sub-distal dorsal on all metatarsi; all tarsi with onychium, claws bipectinate. *Palp*: weak spines scattered on all segments; 2 dorsal (1, 1) trichobothria on tibia; tarsal claw absent. *Abdomen* (figs 32 & 34): ovoid; soft, without plates; posterior pair of spiracles just behind epigastric groove; epigastric region with faint, dark, longitudinal band (fig 34); 3 pairs of spinnerets subequal in length, anterior pair thickest, median pair thinnest; colulus with 2 bristles.

Holotype ♀ (BISHOP 3741), Punahou Park, Honolulu, Oahu, ex Bamboo leafmold, 13. VI. 1964, Suman. ♂ unknown.

This species can be easily separated from *O. hunus* and the ♀ of *O. kilikus* by the absence of any sclerotization on the venter of the abdomen. The color of the abdomen is brown as opposed to the pale color of the other 2 species and is distinctly hairier.

***Oonopinus hunus* Suman, n. sp. Figs. 35-37.**

♀. *Measurements* (in mm)

Carapace, length 0.89; width 0.73; height 0.30.

Abdomen, length 1.31; width 0.81; height 0.94.

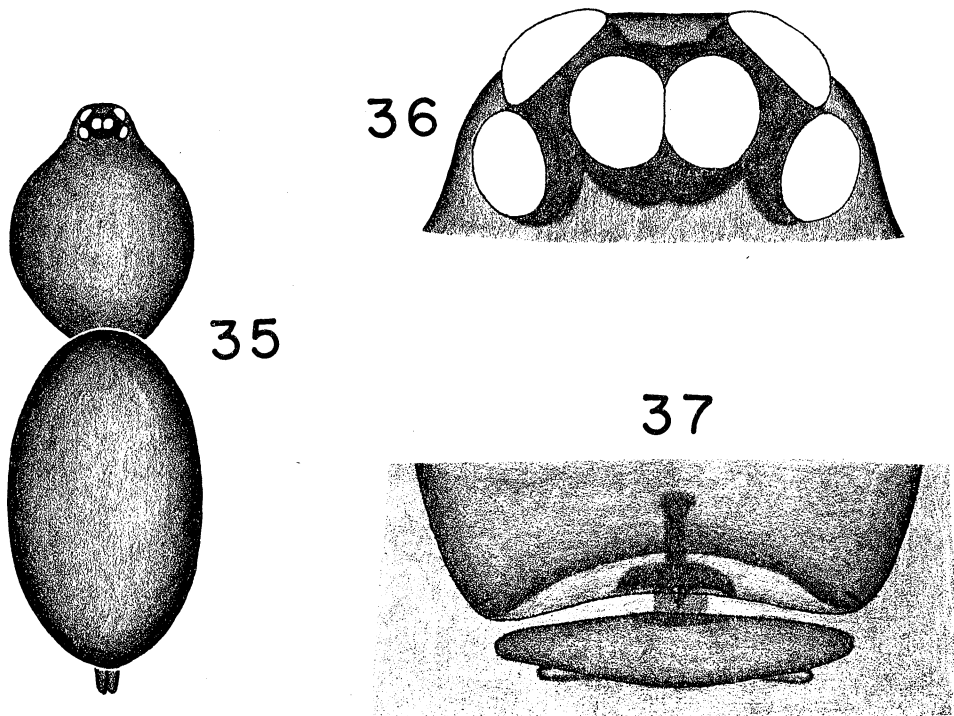
| Leg | Femur | Patella | Tibia | Metatarsus | Tarsus | Total |
|------|-------|---------|-------|------------|--------|-------|
| 1 | 0.70 | 0.36 | 0.62 | 0.57 | 0.29 | 2.54 |
| 2 | 0.81 | 0.36 | 0.70 | 0.70 | 0.34 | 2.91 |
| 3 | 0.63 | 0.31 | 0.45 | 0.48 | 0.25 | 2.12 |
| 4 | 0.95 | 0.36 | 0.78 | 0.81 | 0.31 | 3.21 |
| Palp | 0.36 | 0.24 | 0.31 | - | 0.42 | 1.33 |

Carapace, abdomen, pale yellow; sternum, coxae, white; black around eyes; body surface smooth with few scattered hairs; legs moderately hairy. *Carapace* (fig 35): from above, broadly oval, narrowed in eye region, posterior margin straight; from side, slopes up gradually from anterior end then drops sharply to posterior margin at about 3/5 of length. *Eyes* (fig 36): 6, all pale; eye group occupies about 7/8 width of head; posterior row recurved, ALE-PME row more strongly procurved; ratio of ALE : PLE : PME=8 : 7 : 7; PME contiguous; ALE separated from PME by 2/8, from PLE by 1/8 and from each other by 6/8 diameter of ALE; PLE separated from PME by 2/8 diameter of ALE; clypeus height=6/8 diameter of ALE. *Chelicerae*: vertical; boss absent; double row of hairs beside promargin; teeth lacking, numerous denticles present in groove. *Maxillae*: convergent; slightly more than 2× as long as wide; scopula on distal and inner lateral margin. *Labium*:

free; wider than long; scopula on distal margin. *Sternum*: scutiform; as wide as long; extends between coxae 4 and separates them by width of a coxa; lateral projections extend to base of each coxa; sclerotized connections to carapace absent. *Legs*: 4, 2, 1, 3; spines- 2 dorsal (1, 1) on all femora, 2 prolateral (1, 1) on tibia of leg 1, scattered on tibiae of legs 3 & 4, 2 pairs ventral on metatarsi of legs 1 & 2, scattered on metatarsi of legs 3 & 4; trichobothria- 3 dorsal (1, 2) on all tibiae, 1 subdistal dorsal on all metatarsi; all tarsi with onychium, claws bipectinate. *Palp*: spines- 3 ventral (1, 1, 1) on femur, 1 pair dorsal at distal end of patella, scattered on tibia and tarsus; 3 dorsal trichobothria in a row on tibia; tarsal claw absent. *Abdomen* (figs 35 & 37): ovoid; structure of epigastric region as in fig 37; region anterior to epigastric groove sclerotized; small plate and posterior pair of spiracles just behind groove; dorsal plate lacking; 3 pairs of spinnerets subequal in length, posterior pair thickest, median pair thinnest; colulus with 2 bristles.

Holotype ♀ (BISHOP 3742), SE slope of Ulumawao peak, Kailua, Oahu, ex leafmold, 8. XI. 1964, Suman. Paratypes (BISHOP): 4♀♀, same data. SPECIMEN EXAMINED (BISHOP): ♀, South end of Waianae Mtns, Oahu, ex leafmold, 15. VII. 1964, Suman. ♂ unknown.

Characters separating this species from *O. pihulus* are discussed under *pihulus*. *O. hunus* can be separated from the ♀ of *O. kilikus* by its larger size, comparing the epigastric regions to figs 37 & 42 and the relative lengths of legs 1 & 2. Leg 2 is distinctly longer than leg 1 in *honus*, while legs 1 & 2 are subequal in length in *kilikus*.



Figs. 35-37. *Oonopinus hunus* Suman, n. sp. 35, ♀, dorsal view; 36, ♀ eye group, dorsal view; 37, ♀ epigastric region.

Oonopinus kilikus Suman, n. sp. Figs. 38-42.♂. *Measurements* (in mm)

Carapace, length 0.76; width 0.53; height 0.25.

Abdomen, length 0.81; width 0.43; height 0.46.

| Leg | Femur | Patella | Tibia | Metatarsus | Tarsus | Total |
|------|-------|---------|-------|------------|--------|-------|
| 1 | 0.60 | 0.29 | 0.43 | 0.41 | 0.24 | 1.97 |
| 2 | 0.56 | 0.29 | 0.42 | 0.41 | 0.24 | 1.90 |
| 3 | 0.48 | 0.25 | 0.32 | 0.34 | 0.20 | 1.59 |
| 4 | 0.66 | 0.32 | 0.52 | 0.53 | 0.24 | 2.27 |
| Palp | 0.20 | 0.10 | 0.14 | - | 0.15 | 0.59 |

Cephalothorax, appendages yellow; black around eyes; abdomen very pale; body surface smooth, few scattered hairs; legs moderately hairy. *Carapace* (fig 38): from above, oval, narrowed in eye region, posterior margin straight; from side, slopes up gradually from anterior end then drops sharply to posterior margin at 2/3 of length. *Eyes* (fig 39): 6, all pale; eye group occupies about 3/4 width of head; posterior row strongly recurved, ALE-PME row more strongly procurved; ratio of ALE : PLE : PME = 6 : 6 : 6; PME contiguous; ALE almost contiguous to PLE; ALE separated from PME by 1/6 and from each other by 4/6 diameter of ALE; PLE separated from PME by 1/6 diameter of ALE; clypeus height = 3/6 diameter of ALE. *Chelicerae* (fig 40): vertical; boss absent; double row of hairs beside promargin; large tubercle on inner face where fang tip touches; teeth, denticles lacking. *Maxillae*: convergent; slightly more than 2× as long as wide; scopula on distal and inner lateral margin. *Labium*: free; wider than long; scopula on distal margin. *Sternum*: scutiform; longer than wide; extends between coxae 4 and separates them by slightly more than 1/2 width of a coxa; lateral projections extend to base of each coxa; sclerotized connections to carapace absent. *Legs*: 4, 1, 2, 3; spines (weak)—none on legs 1 & 2; scattered on femora, tibiae, metatarsi of legs 3 & 4, 1 prolateral on patella of leg 4, absent on patella of leg 3; trichobothria—3 dorsal (1, 2) on all tibiae, 1 sub-distal dorsal on all metatarsi; all tarsi with onychium, claws bipectinate. *Palp* (fig 41): spines absent; 2 dorsal trichobothria on tibia; bulb and tarsus fused; distal tip of bulb drawn out into long slender curved embolus. *Abdomen* (fig 38): ovoid; region anterior to epigastric groove and around pedicel lightly sclerotized; plate and posterior pair of spiracles just behind groove; dorsal plate lacking; anterior and posterior pairs of spinnerets subequal in length and thickness, median pair shorter and thinner; colulus not evident.

♀. *Measurements* (in mm)

Carapace, length 0.74; width 0.55; height 0.28.

Abdomen, length 0.94; width 0.56; height 0.63.

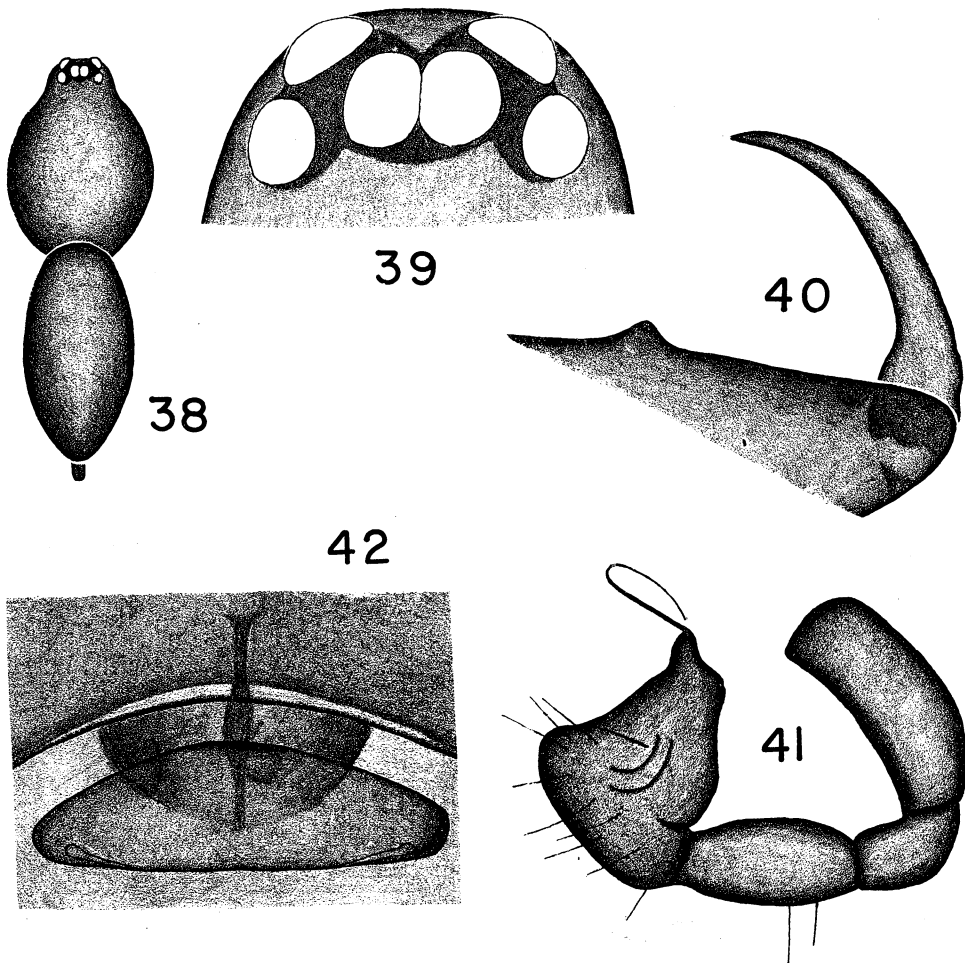
| Leg | Femur | Patella | Tibia | Metatarsus | Tarsus | Total |
|------|-------|---------|-------|------------|--------|-------|
| 1 | 0.56 | 0.31 | 0.42 | 0.38 | 0.25 | 1.92 |
| 2 | 0.56 | 0.32 | 0.41 | 0.39 | 0.25 | 1.93 |
| 3 | 0.48 | 0.27 | 0.31 | 0.34 | 0.20 | 1.60 |
| 4 | 0.67 | 0.32 | 0.52 | 0.52 | 0.22 | 2.25 |
| Palp | 0.18 | 0.13 | 0.14 | - | 0.22 | 0.67 |

Very similar to ♂ in structure; 2 pairs of contiguous dark spots just anterior to spinnerets on venter, 1 pair of large faint dark patches ventrolateral at about midpoint of abdomen;

large tubercle on inner face of chelicerae lacking; legs 1 & 2 subequal in length; palp with 2 dorsal trichobothria on tibia, spines and tarsal claw absent; epigastric region (fig 42) with dark longitudinal band.

Holotype ♂ (BISHOP 3743), SE slope of Ulumawao peak, Kailua, Oahu, ex leafmold, 1. XI.1964, Suman. Allotype ♀ (BISHOP), same data. Paratypes (BISHOP): ♂, same data. SPECIMENS EXAMINED (BISHOP): ♀, near Kahana Bay, Oahu, ex leafmold, 14.XI.1964, Suman; ♀, West slope of Puu Papaa, Kaneohe, Oahu, ex leafmold, 22.XI.1964, Suman; 2♂♂, 2♀♀, SE slope of Ulumawao peak, Kailua, Oahu, ex leafmold, 8.XI.1964, Suman.

This species differs from *O. pruvotae* Berland by the structure of the ♂ palp. The distal portion of the bulb of *O. kilikus* is much narrower than figured for *pruvotae* and the long slender embolus is strongly curved and originates at the distal tip of the bulb rather than



Figs. 38-42. *Oonopinus kilikus* Suman, n. sp. 38, ♂, dorsal view; 39, ♂ eye group, dorsal view; 40, ♂ chelicera, prolateral view; 41, ♂ palp, retrolateral view; 42, ♀ epigastric region.

subdistal. Diagnostic characters separating *kilikus* from *pihulus* and *humus* are discussed under those species.

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