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A Revision of the Mygalomorph Spider Genus *Idioctis* (Araneae, Barychelidae)

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ABSTRACT

The barychelid genus *Idioctis* L. Koch (1874) is revised and includes six species: the type species *Idioctis helva* L. Koch (1874), *I. littoralis* Abraham (1924), *I. intertidalis* (Benoit and Legendre, 1968), and three new species, *I. eniwetok* from the Mar-

shall Islands, *I. hawaiiensis* from Hawaii, and *I. xmas* from Christmas Island in the northeastern Indian Ocean. The cause of the Indo-Pacific distribution of *Idioctis* may require some dispersal components.

INTRODUCTION

Idioctis was the first barychelid and the second mygalomorph described from Fiji or any island so distant from a continent. The genus included only *Idioctis helva* L. Koch (1874), from Fiji. Three species (*I. palmarum* Hogg, 1901, *I. ornata* Rainbow, 1912, and *I. papuensis* Rainbow, 1920) were later erroneously assigned to the genus. Abraham (1924) described a fifth species, *I. littoralis*, and described its burrows (constructed in mangroves). Subsequently, Marples (1951) described similar littoral habits for *Idioctis helva*, from Samoa. Spiders of the genus seem to share a common habitat; they are associated with littoral and near-tidal areas.

After Koch's description, the concept of this genus was long confused or misunderstood. Koch (1874) misstated that the labium of *Idioctis* is longer than wide, which would be unique in the Barychelidae. Simon (1892) was therefore unable to determine its relationships until the error was eliminated (Simon, 1903). Until recently, the lack of a revision blocked a broader taxonomic and biogeographic account of the genus.

Idioctis was one of the first barychelid genera described and was given a very brief diagnosis, sufficient to distinguish it only from other genera then described. Hence, three species from the Australian region were at-

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tributed wrongly to *Idioctis*. The first, *I. palmarum*, from central Australia, was transferred to *Idiommata* by Raven (1985). Other species placed in *Idioctis*, *I. ornata* Rainbow (1912), from Queensland, and *I. papuensis* Rainbow (1920), from New Guinea, have three claws, lack claw tufts, and were transferred to *Dyarcycops* by Main (1977) and later (Main, 1985) to *Misgolas* Karsch (1878), with which I agree. Apart from that, only *I. littoralis* Abraham (1924), from Malaysia, and the type species have been assigned correctly to *Idioctis*.

In studying relationships of all valid mygalomorph genera (see Raven, 1985), I transferred to *Idioctis*, *Atrophonysia intertidalis* Benoit and Legendre (1968), which occurs also in the littoral zone but in the Republic of Malagasy. In the collections of the American Museum of Natural History and the Australian National Insect Collection, Canberra, Australia, two further and new species were noted from Hawaii and Christmas Island.

MATERIALS AND METHODS

All abbreviations are standard for the Araneae and explained in Raven (1984). The width of the eye group or median ocular quadrangle is the distance between the two most separated points in a line orthogonal to the long axis of the spider. All measurements save those for eyes are given in millimeters.

ACKNOWLEDGMENTS

For the loan of types of *Idioctis* and *Atrophonysia* and for permitting the examination of *Idiophthalma*, I am grateful to Drs. G. Rack (ZMH, Zoologisches Museum und Zoologisches Institut, Hamburg), M. Hubert (MNHP, Muséum National d'Histoire Naturelle, Paris), R. Jocqué (MRAC, Musée Royal de l'Afrique Centrale, Tervuren), and Mr. P. D. Hillyard (BMNH, British Museum (Natural History), London), Mr. K. Walker (Museum of Victoria), and Dr. M. R. Gray (AM, Australian Museum, Sydney). I am also grateful to Dr. Joe Beatty for allowing me access to interesting mygalomorphs in his collection. Research involving this manuscript was carried out while I was in receipt of a CSIRO (Australia) postdoctoral fellow-

ship with the superb facilities of the Department of Entomology, American Museum of Natural History, New York, and continued at the Division of Entomology, Canberra, CSIRO Australia. Drs. N. I. Platnick (American Museum of Natural History) and F. A. Coyle (Western Carolina University) criticized the manuscript. Some figures were drawn by Miss J. Gallon. For all of that I am very grateful.

BIOGEOGRAPHY

One mygalomorph genus, *Idioctis*, with different species occurring in the Malagasy Republic (Benoit and Legendre, 1968), the Marshall and Yap Islands, Malaysia (Abraham, 1924), Fiji (Koch, 1873, 1874), and Samoa (Marples, 1955), Christmas Island, and Hawaii, and found near beaches and littoral areas challenges conventional vicariance wisdom. Four alternatives seem possible: first, the taxonomy is wrong and either they are one widespread species or several genera; second, they have dispersed far more actively than most other mygalomorph genera; third, the regions concerned were much closer or contiguous; or fourth, a combination of the above. Clearly, the relative recency of Hawaii will always be a problem. Detailed assessment of these possibilities is not feasible without more knowledge of the males and without consideration of the distributions of other mygalomorphs, which will be addressed in a future manuscript (Raven, in prep.).

IDIOCTIS KOCH

Idioctis Koch, 1874: 484 (type species by monotypy *Idioctis helva* L. Koch).

Atrophonysia Benoit and Legendre, 1968: 330 (type species by original designation *Atrophonysia intertidalis* Benoit and Legendre). First synonymized by Raven, 1985: 113.

DIAGNOSIS: *Idioctis* can be distinguished from *Idiophthalma* by the narrow fovea and absence of a strong rastellum, and from other barychelid genera by the relatively short but strongly trapezoidal eye group. Most species of *Idioctis* have a narrow sternum.

DESCRIPTION: Carapace hirsute, without pattern. Fovea very broad, procurved, or straight. Rastellar spines few, not on raised

mounds. Maxillae usually with about 18–20 cuspules on inner anterior corner; anterior lobe and posterior heel produced. Labium wide, without cuspules. Sternum long, narrow (about 1.5 times longer than wide), with small, marginal sigilla, if evident. Scopulae (females) entire on metatarsi and tarsi I and II, divided by setae on metatarsi and tarsi III, and on metatarsi IV, if present. Paired claws of females with teeth on medial keel. Tarsi with clavate and filiform trichobothria. Males: tibia I with prolateral spur and megaspine, more distal prolateral megaspine, and associated cuticular “thumb”; palpal bulb pyriform.

INCLUDED SPECIES: *I. helva*, *I. xmas*, new species, *I. littoralis*, *I. intertidalis*, *I. hawaiiensis*, new species, *I. eniwetok*, new species.

REMARKS: Bonnet (1957: 2286) dated the generic name from Koch’s key (1873), apparently published one year before the description of the type species; however, the valid date of both genus and species is that of the later publication (Koch, 1874).

DISTRIBUTION: The genus is known from the Malagasy Republic (Benoit and Legendre, 1968), Seychelles (Benoit, 1978), Malaysia (Abraham, 1924), Fiji (Koch, 1873, 1874), Samoa (Marples, 1955), Christmas Island, the Marshall and Yap Islands, and Hawaii, and is found near beaches and littoral areas.

Idioctis helva L. Koch

Figures 1–5

Idioctis helva L. Koch, 1874: 484, tab. 37, figs. 3a, b. Hogg, 1901: 241–242, fig. 26a. Marples, 1955, 453–454.

TYPES: Female lectotype (here designated), Ovalau, Fiji (Mus. Godeffroy no. 8097), deposited in the Zoologisches Museum, Hamburg; paralectotype juvenile, same data; paralectotype female, same locality, deposited in the British Museum (Natural History).

DIAGNOSIS: Females of *I. helva* differ from those of other species by the wider configuration of the eyes (fig. 1) and the smaller PMS (fig. 4). Males unknown.

FEMALE LECTOTYPE: Total length, including chelicerae, 12.8. Generally orange brown. Carapace 4.80 long, 3.42 wide; covered

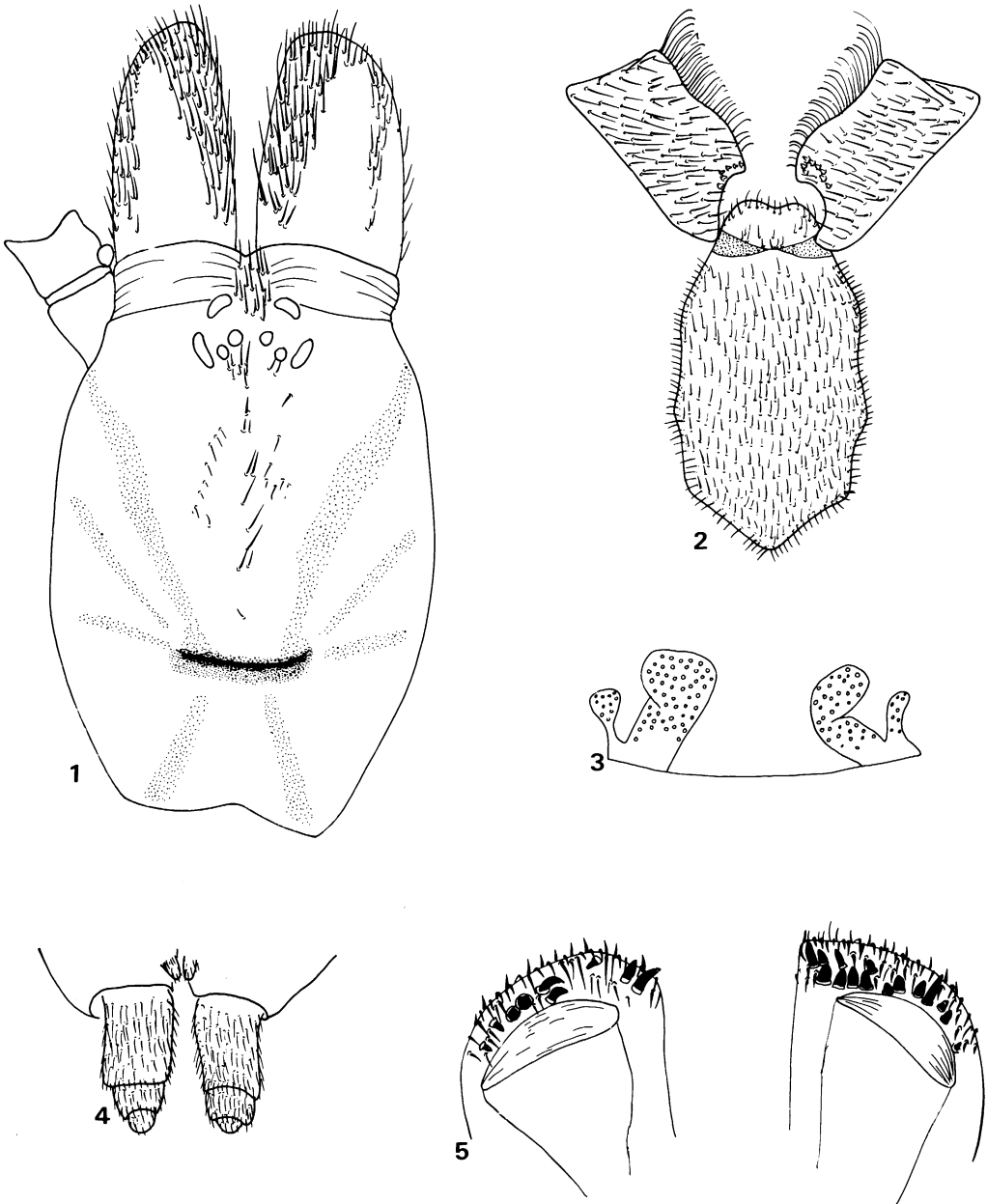
uniformly with numerous silvery hairs; 10–15 setae on medial caput; numerous brown setae on caput; four thick setae between posterior median eyes; numerous silver hairs on lateral margins; clypeus absent; caput raised, striae distinct; fovea broad straight.

Eight eyes on low tubercle in three rows, occupying 0.36 of front head width. Ratio of eyes, anterior median : anterior lateral : posterior median : posterior lateral, 9:15:9:18. Group is wider behind than long (74/48), and wider behind than in front (74/62). Eye interspaces (as diameters of an AME): AME-AME 1.0; ALE-ALE 2.6; AME-ALE 1.2; PME-PLE 0.2; PME-PME 2.8; ALE-PLE 1.1. Posterior row procurved from above. Median ocular quadrangle wider behind than long (40/16), wider behind than in front (40/26). Chelicerae covered with silvery brown hairs; rastellum consists of ten thick (four as long as wide) coniform spines in short distal line; nine thick teeth on promargin, and four small basomesally.

Labium 0.76 wide, 0.38 long; without cuspules, separated from sternum by two triangular depressions. Maxillae 1.14 long in front, 1.74 long behind, 0.76 wide; with 6–10 spindle-shaped cuspules in close group on inner angle; anterior lobe and posterior “heel” produced. Sternum 2.26 long, 1.50 wide; sigilla not evident in lectotype.

Leg formula 4123. With short coniform spines on prolateral patellae III and IV. Scopulae: entire on palpal tarsi, metatarsi I, and tarsi I, II; divided by setae on metatarsi III, and tarsi III, IV. Preening combs absent but several bristles in line on distal ventral edge of metatarsi III, IV. Paired claws with four to five teeth in one row on ectal faces of claws, all paired claws extend beyond tufts; palpal claw bare. About six trichobothria discernible with difficulty on metatarsi, three clavate and 16 filiform on tarsi in five distally diverging rows, six to eight extending for three-quarters of tibia. Spination (no spines on tarsi): leg I, femur d4, patella 0, tibia v3, metatarsus 0; leg II, femur d4, patella 0, tibia p1, v4, metatarsus v1; leg III, femur d5, patella p18, tibia v5, metatarsus v7; leg IV, femur d7, patella p9, tibia v6, metatarsus v4.

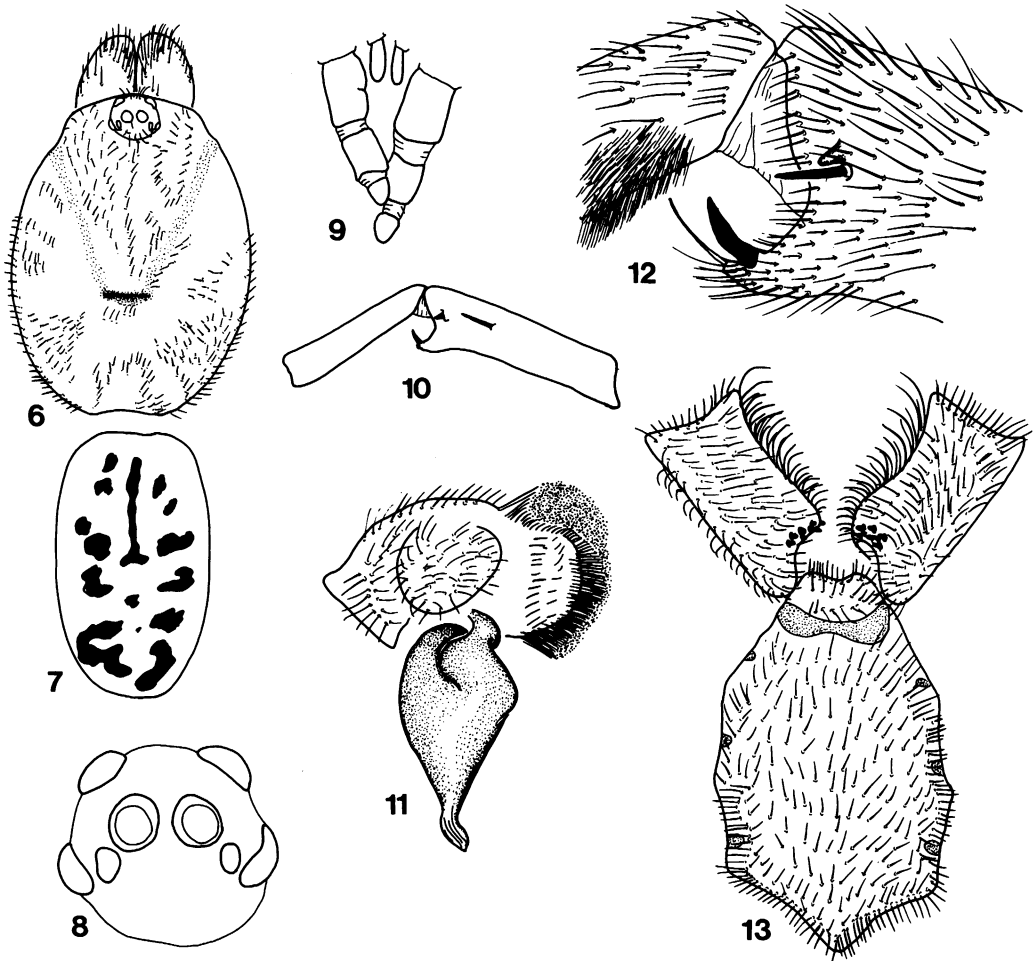
Palp with five spines dorsally on femur, and one prolateral and six ventral on tibia; claw without teeth.



Figs. 1-5. *Idioctis helva*, female lectotype. 1. Cephalothorax and chelicerae, dorsal view. 2. Sternum, maxillae, and labium, ventral view. 3. Spermathecae, dorsal view. 4. Spinnerets, ventral view. 5. Anterior chelicerae showing rastellum, ventral view.

	I	II	III	IV	Palp
Femur	3.03	2.63	2.30	2.83	2.30
Patella	2.04	1.84	1.45	2.11	1.05
Tibia	1.97	1.58	1.45	2.83	1.18
Metatarsus	1.32	1.32	1.18	2.04	—
Tarsus	<u>1.05</u>	<u>0.66</u>	<u>0.79</u>	<u>0.99</u>	<u>1.45</u>
Total	9.41	8.03	7.17	10.80	5.98

Abdomen 6.25 long, 4.34 wide. Three-segmented posterior lateral spinnerets with basal, median, and apical segments 0.76, 0.26, 0.08 long, respectively. Posterior median spinnerets 0.23 long, 0.11 wide, and 0.05 apart. Spermathecae two, each consisting of



Figs. 6–13. *Idioctis hawaiiensis*, holotype male. 6. Cephalothorax and chelicerae, dorsal view. 7. Abdomen, dorsal view. 8. Eyes, dorsal view. 9. Spinnerets, ventral view. 10, 12. Tibia and metatarsus I, prolateral view. 11. Cymbium and bulb, proventral view. 13. Sternum, maxillae, and labium, ventral view.

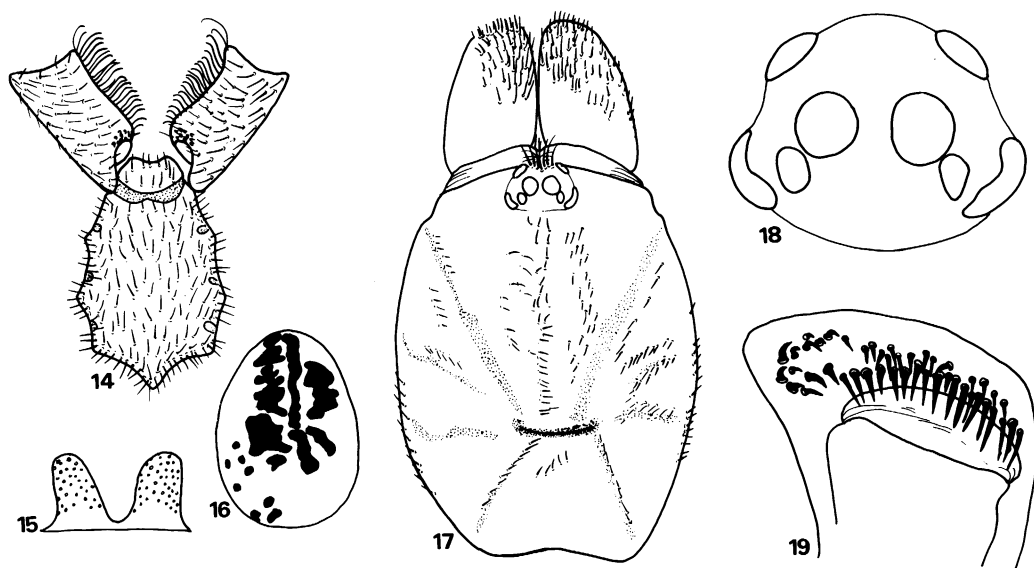
two short dissimilar lobes, ental lobe stout, ectal lobe slender (fig. 3).

DISTRIBUTION AND BURROW: *Idioctis helva* is known only from the type locality (Fiji), and Samoa (Marples, 1951, 1955), where it was found in small nests on the beach line. Koch (1874: pl. 34, fig. 3) showed a J-shaped burrow with a short shaft and trapdoor leading to the long arm of the burrow.

REMARKS: Hogg (1896) identified a specimen from central Australia as *I. helva* but later named it *I. palmarum*. Hogg's (1901: fig. 26c) illustration of *I. palmarum* shows and he stated that the whole eye group is

wider than long. However, on the surviving holotype (Australian Museum, Sydney), the eye group is longer than wide, as is typical of *Idiommata*, to which the species was transferred (Raven, 1985: 161). The holotype of *I. palmarum* lacks chelicerae but a loose pair of chelicerae of the expected size are present in a vial also labeled *I. palmarum* in the Museum of Victoria. That vial also contains other conspecific females.

MATERIAL EXAMINED: The lectotype plus three females collected close to the high tide mark on Upolu, Samoa (B. J. Marples; BMNH 1974.129); 14 females and eggs from



Figs. 14–19. *Idiopsis hawaiiensis*, paratype female. 14. Sternum, maxillae, and labium, ventral view. 15. Spermathecae, dorsal view. 16. Abdomen, dorsal view. 17. Cephalothorax and chelicerae, dorsal view. 18. Eyes, dorsal view. 19. Anterior left chelicera showing rastellum, ventral view.

Nuulopa, Samoa (B. J. Marples; BMNH 1974).

***Idiopsis hawaiiensis*, new species**

Figures 6–19

TYPE: Male holotype from Necker Island, Hawaii (June 29, 1923; E. H. Bryan, Jr.) deposited in the American Museum of Natural History.

ETYMOLOGY: The specific epithet reflects the type locality.

DIAGNOSIS: *I. hawaiiensis* differs from all other species of *Idiopsis* by the slightly wider sternum, the undivided spermathecae, and the eye group being relatively shorter in relation to the back width.

MALE: Total length, including chelicerae, 14.6. Carapace, legs, and chelicerae yellow to orange brown. Abdomen dorsally pallid with several irregular brown paired lateral markings, and discontinuous longitudinal medial marking with more brown posteriorly; ventrally yellow brown.

Carapace 7.12 long, 5.36 wide; eight setae between ALE-ALE and PME-PME spaces, numerous long setae on medial caput, thoracic setae form radial lines mixing with hairs on strial edges, lateral margins with several

lines of setae. Thoracic groove moderately wide, transverse, straight.

Eight eyes in three closely set rows, group occupying about 0.47 of front width, wider behind than long (62/40), wider behind than in front (62/49). Ratio of eyes, anterior median : anterior lateral : posterior median : posterior lateral, 12:17:10:17. Eye interspaces as AME diameters: AME-AME 0.6; AME-ALE 0.7; ALE-ALE 1.6; PME-PLE 0.1; PME-PME 2.4; ALE-PLE 1.1. Posterior row slightly recurved. Median ocular quadrangle wider than long (42/21), narrower in front (42/31).

Sternum 3.64 long, 2.44 wide; all sigilla small, oval, marginal. Labium 1.08 wide, 0.52 long. Maxillae 1.80 long in front, 2.40 long behind, 1.00 wide; with 8 to 10 blunt cusps; anterior lobe barely distinct; posterior "heel" acutely rounded. Chelicerae with long brown setae and hairs on anterior face; rastellum consists of six to eight long thick bristles on distal edge; promargin with about five thick and six smaller teeth, no basomesal granules.

Leg formula 4123. Tibia I with distal, pro-lateral spur and megaspine and prodorsal megaspine dorsad of which occurs thumblike cuticular process. Scopula thin but entire on metatarsi and tarsi I, divided by one row of

setae on metatarsi II, thin on tarsus II, thin, distal, and bipartite on metatarsi III, divided by narrow band of setae on tarsi III, two clumps of distal hairs on metatarsi IV, and divided by two narrow bands of setae with scopula as wide as one setal band. Preening combs absent. Spination (no spines on tarsi): leg I, femur p1, patella v1, tibia p1, v1 + 2 megaspines, metatarsus 0; leg II, femur p1, d2, r3, patella 0, tibia p2, v4, metatarsus v1; leg III, femur p2, d3, r4, patella p3, tibia p2, r2, v3, metatarsus p4, r4, v6; leg IV, femur p1, r2, patella v1, tibia p1, r4, v8, metatarsus p6, r4, v9. Paired tarsal claws without teeth, all project through claw tufts. About 15 trichobothria in curving row on metatarsi, about 20 in two separated bands on tarsi, two groups of about eight for half of tibial length.

	I	II	III	IV	Palp
Femur	5.76	5.36	4.88	6.48	3.04
Patella	3.44	3.20	2.48	3.20	2.00
Tibia	4.64	4.16	3.68	5.76	2.24
Metatarsus	4.64	3.68	4.08	6.32	—
Tarsus	<u>2.16</u>	<u>2.08</u>	<u>1.92</u>	<u>2.56</u>	<u>1.52</u>
Total	20.64	18.48	17.04	24.32	8.80

Palp with three spines ventrally on tibia; bulb pyriform with distally flanged embolus; cymbium with two deeply divided lobes.

Abdomen 5.76 long, 3.52 wide. Three-segmented posterior lateral spinnerets with basal, median, and apical segments, 0.80, 0.56, 0.24 long, respectively. Posterior median spinnerets 0.40 long, 0.12 wide, 0.08 apart.

FEMALE: Total length, including chelicerae, 21.3. Carapace, legs, and chelicerae yellow brown. Abdomen dorsally brown with extensive medial and lateral markings; ventrally yellow brown.

Carapace 9.04 long, 6.88 wide; six long setae on clypeal edge, three long setae in front of AME, caput covered with covering of brown erect setae; hair finer, denser on thorax. Thoracic groove broad, slightly procurved.

Eight eyes in three closely set rows, group occupying about 0.30 of front width, wider behind than long (84/50), wider behind than in front (84/65). Ratio of eyes, anterior median : anterior lateral : posterior median : posterior lateral, 21:19:11:21. Eye interspaces as AME diameters: AME-AME 0.4;

AME-ALE 0.5; ALE-ALE 1.7; PME-PLE 0.1; PME-PME 1.9; ALE-PLE 0.9. Posterior row slightly recurved. Median ocular quadrangle wider than long (55/29), narrower in front (55/45).

Sternum 4.80 long, 3.44 wide; all sigilla small, oval, marginal. Labium 1.52 wide, 0.80 long. Maxillae 2.40 long in front, 3.60 long behind, 1.52 wide; with 12–16 cuspules; anterior lobe barely distinct; posterior “heel” acutely rounded. Chelicerae with similar setation to male; rastellum consists of several long thick bristles on distal edge; promargin with about eight thick and two smaller teeth, basomesally with four granules.

Leg formula 4123. Scopula entire on metatarsi and tarsi I and II, thin, distal, and bipartite on metatarsi III, divided by wide band of setae on tarsi III, two clumps of distal hairs on metatarsi IV, and divided by two narrow bands of setae. Preening combs absent. Spination (no spines on tarsi or legs I and II): leg III, femur p1, patella p6 thornlike, tibia p2, r2, v4, metatarsus p3, r2, v4; leg IV, femur 0, patella 0, tibia r2, v6, metatarsus p7, r4, v8. Paired tarsal claws of legs I and II with two very short teeth, leg IV without teeth. About seven trichobothria in diagonal row on metatarsi, about 30 including six clavate in two separated bands on tarsi, two groups of about ten for half of tibial length.

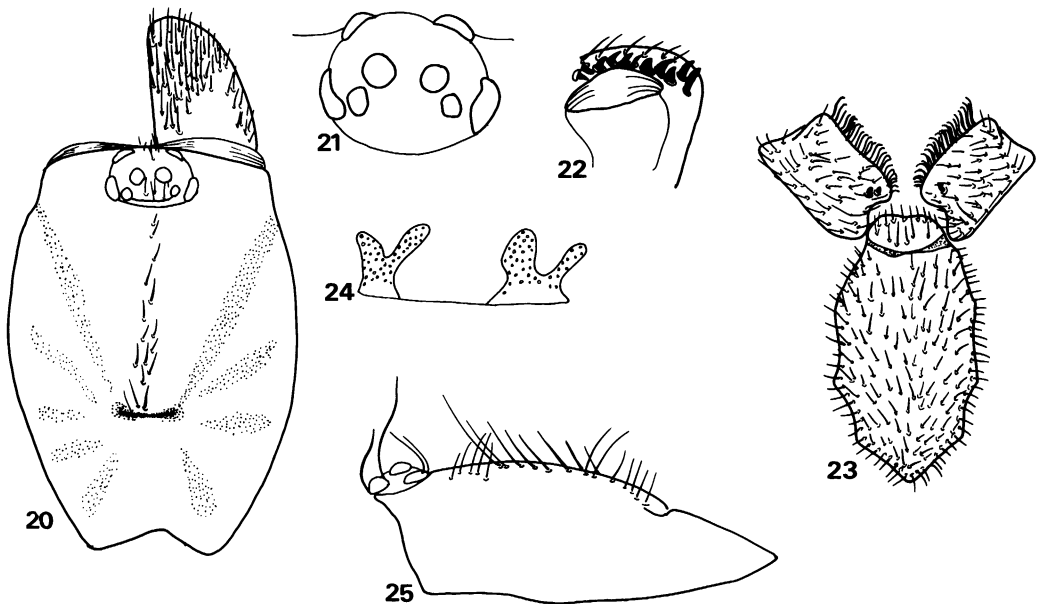
	I	II	III	IV	Palp
Femur	5.28	4.80	4.16	6.61	3.92
Patella	3.60	3.20	2.88	4.00	2.80
Tibia	2.72	2.72	2.56	4.40	2.32
Metatarsus	2.48	2.48	2.40	4.24	—
Tarsus	<u>1.52</u>	<u>1.60</u>	<u>1.76</u>	<u>2.16</u>	<u>2.24</u>
Total	15.60	14.80	13.76	20.96	11.28

Palp entirely without spines; claw bare, totally enclosed by tufts; scopula entire.

Abdomen 9.12 long, 6.72 wide. Three-segmented posterior lateral spinnerets with basal, median, and apical segments 1.12, 0.64, 0.32 long, respectively. Posterior median spinnerets 0.80 long, 0.20 wide, 0.08 apart. Spermathecae two, each a short broad lobe (fig. 15).

DISTRIBUTION: *I. hawaiiensis* is known only from Necker Island, in the northern part of the Hawaiian group.

MATERIAL EXAMINED: The holotype and



Figs. 20–25. *Idioctis intertidalis*. 20–23. Holotype female. 20. Cephalothorax and chelicera, dorsal view. 21. Eyes, dorsal view. 22. Anterior right chelicera showing rastellum, ventral view. 23. Sternum, maxillae, and labium, ventral view. 24, 25. MT 158462. 24. Spermathecae, dorsal view. 25. Cephalothorax, lateral view.

three females collected with it; plus one female and a juvenile also from Necker Island (June 18, 1920; E. H. Bryan Jr.), all deposited in the American Museum of Natural History.

Idioctis intertidalis (Benoit and Legendre)

Figures 20–25

Atrophonysia intertidalis Benoit and Legendre, 1968: 331, figs. 1–5. Benoit, 1978: 408, figs. 2a–c.

Idioctis intertidalis: Raven, 1985: 113.

TYPE: Female holotype and juvenile paratype from Malagasy: Ile de Nossibé (Jan. 1964; J. Rudloe; MT 133.045), in MRAC, examined.

DIAGNOSIS: *I. intertidalis* differs from other *Idioctis* in having two similarly shaped lobes of the divided receptacula, and from *I. helva* by the more compact eye group, and from *I. littoralis* by the relatively narrower carapace.

DESCRIPTION (supplementary to Benoit and Legendre, 1968): Female holotype: Scopulae: entire and for full length of metatarsi I, II, and tarsi I–III; full length but divided on metatarsi III, broadly divided on tarsi IV, absent on metatarsi IV. Four closely spaced

spines ventrally on metatarsi IV. Four to six teeth on outer rows of paired claws of legs I, II, three on outer edges of claws of III, IV. Palpal claw bare.

MATERIAL EXAMINED: Holotype; 4 females, Grande Comore: N. de Itsandra (7 Aug. 1981; R. Jocqué, MT 158.462); 7 females, same data (MT 158.463).

Idioctis littoralis Abraham

Figures 26–30

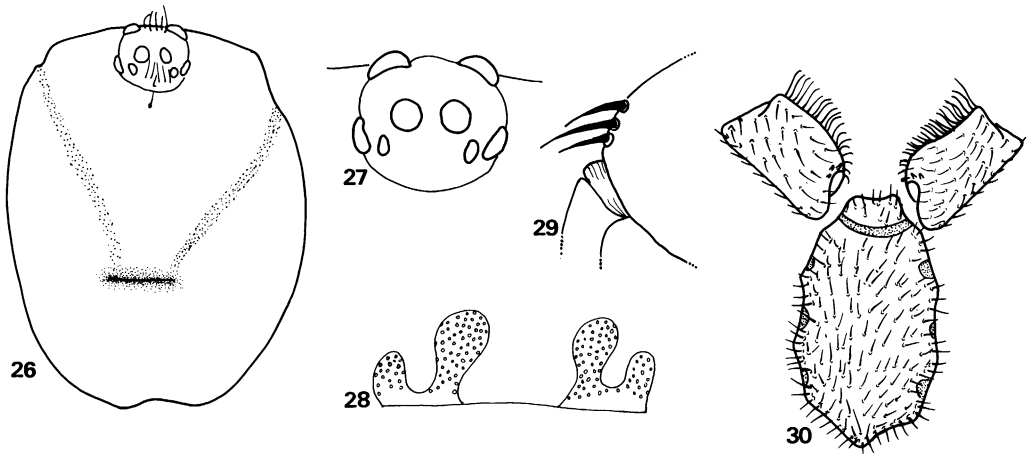
Idioctis littoralis Abraham, 1924: 1098, pl. 2, figs. 8, 9.

TYPE: Female holotype from Singapore Island (Jan. 5, 1923; H. C. Abraham), in BMNH, examined.

DIAGNOSIS: Females of *I. littoralis* differ from those of most *Idioctis* by the weak rastellar spines, and from *I. hawaiiensis* by the bifid spermathecae.

FEMALE: Total length, including chelicerae, 11.0. Carapace, legs, and chelicerae orange brown; abdomen similar.

Carapace 4.32 long, 3.40 wide, with light but uniform covering of hair; several fine se-



Figs. 26–30. *Idioctis littoralis*, holotype female. 26. Cephalothorax, dorsal view. 27. Eyes, dorsal view. 28. Spermathecae, dorsal view. 29. Right chelicera showing rastellum, lateral view. 30. Sternum, maxillae, and labium, ventral view.

tae on clypeal edge, nine thick setae on medial caput; fovea broad, straight.

Eight eyes on low tubercle in three rows, occupying 0.32 of front width. Ratio of eyes, anterior median: anterior lateral: posterior median: posterior lateral, 9:12:7:11. Group wider behind than long (44/30), wider behind than in front (44/37). Eye interspaces (as diameters of an AME): AME-AME 0.6; ALE-ALE 1.6; AME-ALE 1.0; PME-PLE 0.2; PME-PME 2.3; ALE-PLE 1.2. Posterior row procurved from above. Median ocular quadrangle wider behind than long (29/17), wider behind than in front (29/23).

Labium 0.72 wide, 0.40 long, without cuspules, separated from sternum by deep continuous groove. Maxillae 0.92 long in front, 1.52 long behind, 0.80 wide; with three to four long pointed cuspules on inner angle; anterior lobe rounded, posterior "heel" slightly produced. Sternum 2.48 long, 1.64 wide; posterior sigilla small, oval, touching margin, other sigilla not evident. Chelicerae covered with long golden hairs; rastellum consists of six long pointed spinelike setae; fang smooth, promargin of furrow with six large and two small teeth, and three to five small teeth basally.

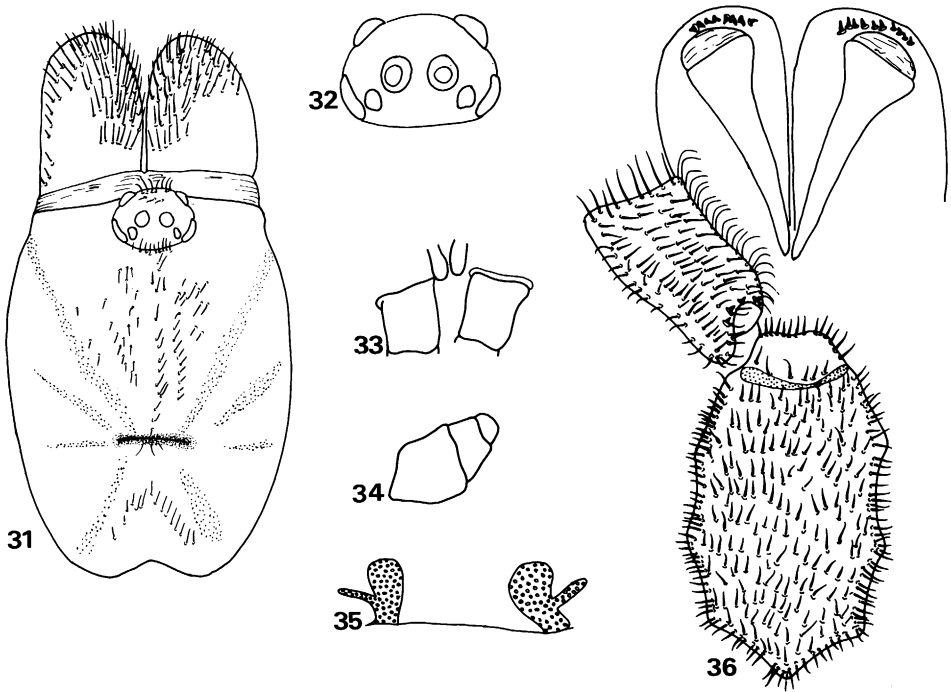
Leg formula 4123. With numerous short coniform spines on prolateral patella III, fewer, weaker on patella IV. Scopula: entire on metatarsi, tarsi I, II; divided by setae on

metatarsi, tarsi III, absent on leg IV. Preening combs consist of group of short thick spinelike setae on ventral edge of metatarsi III, IV. Paired claws with five teeth on ectally displaced keel on leg I, only two teeth on leg IV; all paired claws extending beyond tufts. About six to eight trichobothria on metatarsi, 12 filiform on tarsi, about eight extending for two-thirds of tibiae. Spination (no spines on tarsi): leg I, femur d1, patella 0, tibia p1, v2, metatarsus v1; leg II, femur d3, patella 0, tibia p1, v2, metatarsus v1; leg III, femur 0, patella p21, tibia v1, metatarsus proventral 3, retroventral 3, ventral 2, all comblike; leg IV, femur d4, patella p10, tibia v1, metatarsus proventral 4, ventral 2, retroventral 2, all comblike.

	I	II	III	IV	Palp
Femur	2.83	2.33	2.00	2.83	2.33
Patella	1.92	1.75	1.42	2.08	1.25
Tibia	2.00	1.83	1.50	3.17	1.33
Metatarsus	1.42	1.33	1.33	2.50	—
Tarsus	<u>1.00</u>	<u>1.00</u>	<u>0.92</u>	<u>1.25</u>	<u>1.42</u>
Total	9.59	8.24	7.17	11.83	6.33

Palp with one prolateral and seven ventral spines on tibia; claw without teeth; tarsal scopulae entire.

Abdomen 4.24 long, 2.56 wide. Three-segmented posterior lateral spinnerets with basal, median, and apical segments 0.60, 0.14,



Figs. 31–36. *Idioctis xmas*, holotype female. 31. Cephalothorax and chelicerae, dorsal view. 32. Eyes, dorsal view. 33. Posterior median and basal segment of posterior lateral spinnerets, ventral view. 34. Posterior lateral spinneret, lateral view. 35. Spermathecae, dorsal view. 36. Chelicerae, sternum, maxilla, and labium, ventral view.

0.06 long, respectively. Posterior median spinnerets 0.30 long, 0.14 wide, bases touching. Spermathecae two (fig. 28), each with one long medial and one short ectal lobe.

DISTRIBUTION AND NATURAL HISTORY: *I. littoralis* is known only from Kranji River on the island of Singapore and nearby at Pulau Semakau where the specimens “were found in the mud near roots of mangrove trees between high- and low-water marks” (Abraham, 1924: 1100). Five juveniles were found in short weblined retreats in the mudwall of a crab hole. Another specimen “found on Pulau Semakau had a short tubular retreat, closed by a simple wafer-type door . . . with the hinge on its lower edge, in the crevices of bark of a mangrove tree just below the high-water mark; it was very difficult to see by reason of its having a quantity of bark debris woven into it.” Abraham goes on to add that a specimen of *I. littoralis* refused all food offered until a marine polychaete known to the Malays as “pumpum” was readily taken and consumed.

MATERIAL EXAMINED: Only the holotype. Abraham mentions three females and five immatures; however, only the type was found in the British Museum.

Idioctis xmas, new species

Figures 31–36

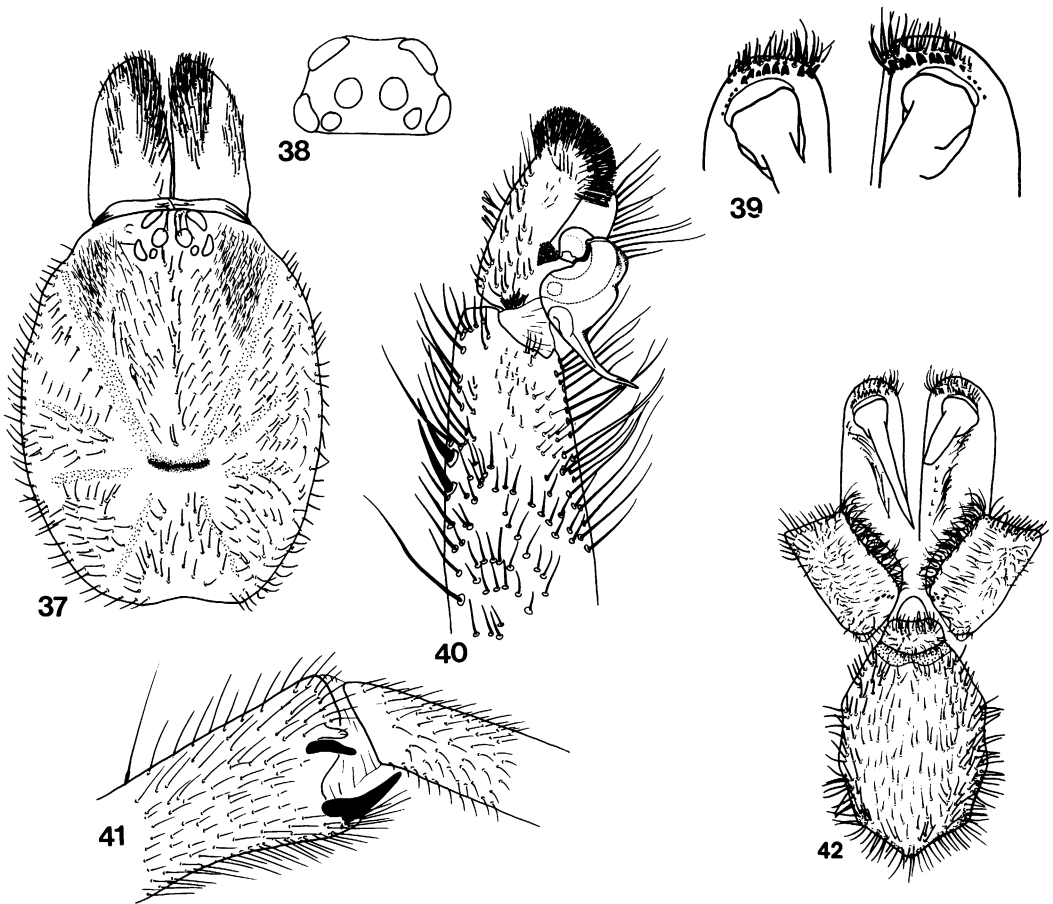
TYPE: Female holotype, Christmas Island (Australia), Indian Ocean, beach or coast pinnacles (Oct. 1983; L. Hill) deposited in the Australian National Insect Collection, CSIRO Australia, Canberra.

ETYMOLOGY: The specific epithet is an abbreviation for Christmas, from the type locality.

DIAGNOSIS: Females of *I. xmas* differ from those of *I. littoralis* by the shorter rastellar spines, larger PLE, and much smaller ectal lobe of the spermathecae.

FEMALE: Total length, including chelicerae, 14.0. Carapace and legs fawn, chelicerae maroon; abdomen gray.

Carapace 5.48 long, 4.16 wide; with uni-



Figs. 37–42. *Idioctis eniwetok*, holotype male. 37. Cephalothorax and chelicerae, dorsal view. 38. Eyes, dorsal view. 39. Chelicerae showing rastellum, ventral view. 40. Palpal tibia, cymbium, and bulb, proventral view. 41. Tibia and metatarsus I, prolateral view. 42. Sternum, maxillae, labium, and chelicerae, ventral view.

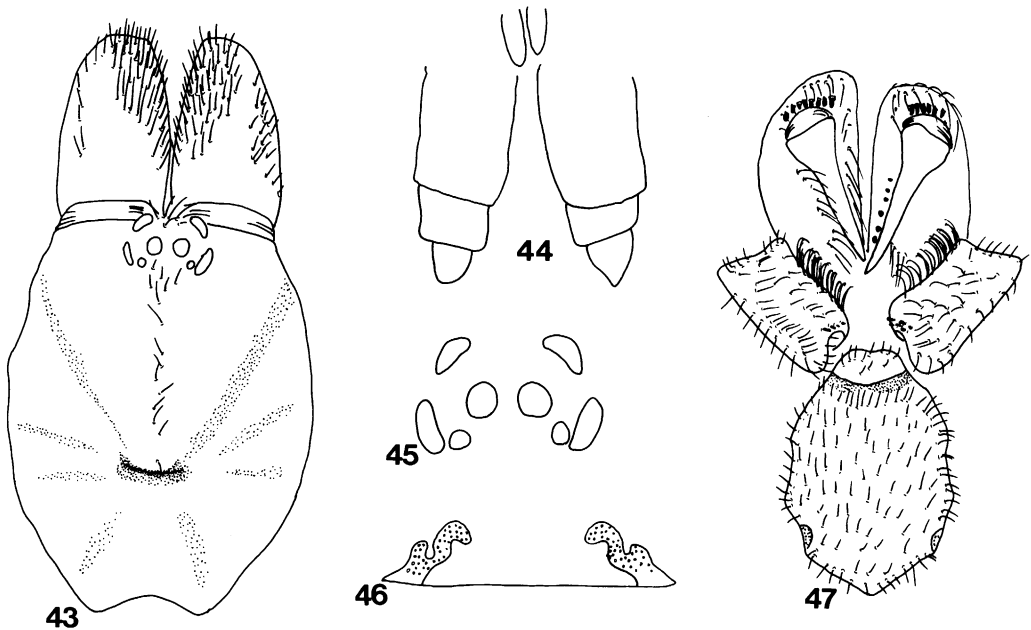
form light covering of hair; several black setae on clypeal edge, about six thick setae on medial caput; fovea broad, straight.

Eight eyes on low tubercle in three rows, occupying 0.32 of front width. Ratio of eyes, anterior median: anterior lateral: posterior median: posterior lateral, 13:14:8:17. Group wider behind than long (57/49), wider behind than in front (57/28). Eye interspaces (as diameters of an AME): AME-AME 0.5; ALE-ALE 1.9; AME-ALE 0.8; PME-PLE 0.1; PME-PME 2.1; ALE-PLE 0.9. Posterior row procurved from above. Median ocular quadrangle wider behind than long (40/18), wider behind than in front (40/28).

Labium 1.00 wide, 0.52 long; without cusps, separated from sternum by deep continuous groove. Maxillae 1.60 long in front,

2.08 long behind, 1.00 wide; with four long pointed cusps on inner angle; anterior lobe rounded, posterior “heel” slightly produced. Sternum 3.00 long, 2.00 wide; all sigilla small, touching margin. Chelicerae covered with fine black bristles; rastellum consists of 9 or 10 long pointed spines overhanging full length of fang; fang smooth, promargin of furrow with eight large and one small tooth, and 10 to 15 small teeth basally.

Leg formula 412? (leg 3 missing). With six short coniform spines on prolateral patella IV. Scopulae: entire on metatarsi, tarsi I, II; widely divided by setae on tarsi IV, absent on metatarsi IV. Preening combs consist of two separated groups, five proventral and seven retroventral, of short thick spinelike setae on ventral edge of metatarsi III, IV.



Figs. 43–47. *Idioctis eniwetok*, paratype female. 43. Cephalothorax and chelicerae, dorsal view. 44. Posterior median and basal segment of posterior lateral spinnerets, ventral view. 45. Eyes, dorsal view. 46. Spermathecae, dorsal view. 47. Sternum, maxilla, and labium, ventral view.

Paired claws, all similar in size, with three to four teeth on ectally displaced keel on leg I, one or no teeth on leg IV; all paired claws extend beyond tufts. About six to eight trichobothria on metatarsi, 20 filiform and up to 6 claviform on tarsi, about eight extending for two-thirds of tibiae. Spination (no spines on tarsi): leg I, 0; leg II, tibia p1; leg III, unknown; leg IV, femur d4, patella p6 thornlike, tibia v1, metatarsus ventral 9 forming comb.

	I	II	III	IV	Palp
Femur	3.76	3.28	—	3.52	3.12
Patella	2.48	2.08	—	2.56	1.92
Tibia	2.72	2.64	—	4.00	1.84
Metatarsus	2.16	1.84	—	3.12	—
Tarsus	<u>1.36</u>	<u>1.36</u>	—	<u>1.36</u>	<u>1.68</u>
Total	12.48	11.20	—	14.56	8.56

Palp with one prolateral and eight ventral spines on tibia; claw without teeth; tarsal scopulae entire.

Abdomen 6.40 long, 3.68 wide. Three-segmented posterior lateral spinnerets with basal, median, and apical segments 0.80, 0.48, 0.16 long, respectively. Posterior median

spinnerets 0.24 long, 0.16 wide, bases 0.12 apart. Spermathecae two (fig. 35), each with one long medial and one slender ectal lobe.

DISTRIBUTION: Known only from Christmas Island, Indian Ocean.

Idioctis eniwetok, new species

Figures 37–47

TYPES: Male holotype from Eniwetok Atoll, Igueron Is., Marshall Islands, pitfall trapped in *Pisonia* forest (17 June 1968; J. W. Beatty); female paratype from Caroline Is., Yap, Yap Islands, taken from burrows under rocks in lowland forest (10 April 1980; J. W. Berry); both deposited in the Bernice P. Bishop Museum, Honolulu.

ETYMOLOGY: The specific epithet reflects the type locality.

DIAGNOSIS: Males of *I. eniwetok* differ from those of *I. hawaiiensis* in the relatively longer style on the palpal bulb; females differ from those of *I. hawaiiensis* in the bilobed spermathecae and from all other species of *Idioctis* in the wider sternum (1.3 times wider than long).

MALE HOLOTYPE: Total length, including

chelicerae, 10.0. Carapace, legs, and chelicerae yellow. Abdomen dorsally pallid; ventrally yellow. Carapace 3.92 long, 3.16 wide; 6 thick anteromedial setae, one long curved and several short bristles between ALE, lateral margins with several lines of setae and golden bushy hair. Thoracic groove moderately wide, transverse, slightly procurved.

Eight eyes in three closely set rows, group occupying about 0.38 of front width, wider behind than long (39/23), wider behind than in front (39/33). Ratio of eyes, anterior median : anterior lateral : posterior median : posterior lateral, 8:12:6:11. Eye interspaces as AME diameters: AME-AME 0.5; AME-ALE 0.8; ALE-ALE 1.5; PME-PLE 0.1; PME-PME 2.0; ALE-PLE 0.5. Posterior row procurved. Median ocular quadrangle wider than long (25/13), narrower in front (25/19).

Sternum 2.20 long, 1.48 wide; all sigilla small, oval, marginal. Labium 0.72 wide, 0.36 long. Maxillae 1.32 long behind, 1.00 long in front, 0.68 wide; with five to eight cuspules; anterior lobe hardly distinct; posterior "heel" rounded. Chelicerae with long brown setae and hairs on anterior face; rastellum consists of about seven long spines on distal edge; promargin with about six thick teeth, basomesally with five smaller teeth; intercheliceral tumescence absent.

Leg formula 4123. Tibia I with distal, pro-lateral spur and megaspine, and prodorsal megaspine dorsad of which occurs distinct thumblike cuticular process almost as long as spine. Scopula thin but entire on metatarsi I and tarsi I, II, divided by one row of setae on metatarsi II, divided by two narrow bands of setae on tarsi III, two clumps of distal hairs on metatarsi III, absent on metatarsi and tarsi IV. Preening combs composed of 3 setae on metatarsi III, and 2 "combs" of two spinelike setae and 1 comb of four setae on distal metatarsi IV. Spination (no spines on tarsi): leg I, femur d4 (weak), patella 0, tibia v2 + 2 megaspines, metatarsus 0; leg II, femur d5, patella 0, tibia p2, v3, metatarsus 0; leg III, femur d4 (weak), patella 10–12 thornlike spines pro-laterally, tibia v4, metatarsus v1; leg IV, femur d4, patella p5, tibia r1, v0, metatarsus 0. Paired tarsal claws with two rows each of five teeth forming distinct scoop in distal one-third; one row of five teeth on leg IV, all claws project through claw tufts. All claw tufts thin

but distinct and of similar size. About 8 trichobothria in curving row becoming two rows distally on metatarsi, about 12 filiform distally in two separated bands and about 5 claviform proximally on tarsi, two groups of about 12 for half of tibial length.

	I	II	III	IV	Palp
Femur	3.68	3.20	2.72	3.52	2.16
Patella	2.08	1.76	1.44	1.76	1.20
Tibia	3.04	2.48	2.28	3.68	1.68
Metatarsus	2.24	2.24	2.16	3.20	—
Tarsus	<u>1.44</u>	<u>1.44</u>	<u>1.12</u>	<u>1.36</u>	<u>0.80</u>
Total	12.48	11.12	9.72	13.52	5.84

Palp with one spine ventrally on tibiae; bulb squat, cubiform with well-defined tapering embolus; cymbium with two deeply divided lobes.

Abdomen 4.08 long, 2.44 wide. Three-segmented posterior lateral spinnerets with basal, median, and apical segments, 0.70, 0.36, 0.20 long, respectively. Posterior median spinnerets 0.28 long, 0.10 wide, 0.06 apart.

FEMALE PARATYPE: Total length including chelicerae, 10.5.

Carapace 3.80 long, 2.96 wide; covered uniformly with numerous fine brown hairs; 10–12 setae on medial caput; numerous brown setae lateral of medial line; one thick and numerous thin setae between median eyes; long fine silver hairs on lateral margins; clypeus absent; caput raised; striae distinct; fovea broad, slightly procurved.

Eyes occupy 0.36 of head width; group wider behind than long (46/28), wider behind than in front (46/36). Ratio of eyes anterior median : anterior lateral : posterior median : posterior lateral, 8:11:5:14. Eye group front : back : long, 36:46:28. Eye interspaces (as AME diameters): AME-AME 0.5, AME-ALE 1.0, ALE-ALE 2.3, ALE-PLE 0.8, PME-PLE 0.1, PME-PME 1.7. Median ocular quadrangle wider than long (30/16), narrower in front (21/30). Posterior row procurved. Chelicerae covered with brown hairs; rastellum consists of 11 thick coniform spines in distal line; 8 thick teeth on promargin, and 8–10 small teeth basomesally.

Labium 0.36 long, 0.72 wide; without cuspules. Maxillae 1.08 long in front, 1.44 long behind, 0.72 wide; with four to six spindle-shaped cuspules in close group on inner angle;

posterior "heel" produced. Sternum 2.20 long, 1.68 wide; sigilla on sloping margin.

Leg formula 4123. With short coniform spines on prolateral patellae III and IV. Scopulae: entire on palpal tarsi and metatarsi, and tarsi I, II; only lateral band on metatarsi III and tarsi III, IV; scopula absent on IV. Several bristles in line on distal ventral edge of metatarsi III, IV form preening comb on each leg. Paired claws with four teeth in one row on ectal faces of I, II; two on each of those on III, and one on IV. All paired claws extend beyond tufts; palpal claw bare. About 8 trichobothria on metatarsi, 2-3 clavate and 8 filiform on tarsi in distally diverging rows; about 8 extending for three-quarters of tibia. Spination: leg I, femur d4, patella 0, tibia v2, metatarsus v1; leg II, femur d3, patella 0, tibia v3, metatarsus v1; leg III, femur d4, patella p18, tibia v4, metatarsus v2; leg IV, femur d5, patella p3, tibia v7, metatarsus v2 (not associated with preening combs). Palp: femur d2, patella v2, tibia v8. Thorn spines patella 3: 18, patella 4: 3.

	I	II	III	IV	Palp
Femur	2.68	2.20	1.80	2.60	2.08
Patella	1.60	1.44	1.20	1.84	1.28
Tibia	1.64	1.36	1.28	2.52	1.12
Metatarsus	1.16	1.16	1.16	1.84	—
Tarsus	<u>0.92</u>	<u>0.84</u>	<u>0.92</u>	<u>0.92</u>	<u>1.16</u>
Total	8.00	7.00	6.24	9.72	5.64

Abdomen 2.72 long, 2.72 wide. Spinnerets: PMS 0.24 long, 0.10 wide, 0.02 apart. Basal, middle, apical, and total articles of PLS 0.58, 0.26, 0.20, 1.04 long, respectively.

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