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Three New Species of False Scorpions from the Island of Guam (Arachnida, Chelonethida)

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INTRODUCTION

The small collection of false scorpions upon which this report is primarily based was obtained in connection with investigations of the vectors of scrub typhus on Guam conducted by George W. Wharton, Jr., H(S) USNR (U. S. Naval Medical Research Unit No. 2). These collections were all taken in association with the free-living stages of a trombiculid mite, which was also studied in this investigation.

In addition to the foregoing material, there has been available for study a small collection of pseudoscorpions taken on Guam by Mr. N. L. H. Krauss of Honolulu.

These are the first chelonethids to be recorded from Guam, or indeed from any island of the Marianas Archipelago. The three included species are closely related to forms occurring in the Philippine Islands.

FAMILY CHTHONIIDAE HANSEN

Tyrannochthonius chamorro, new species (fig. 1, *a-f*).

Diagnosis (female only). Small species of typical facies most closely related to *T. bakeri* Chamberlin. Carapace subquadrate, somewhat narrowed behind; laterally and posteriorly clearly tessellate; with four well-marked eyes, of which the anterior pair are strongly corneate and directed latero-anteriorly; posterior eyes noncorneate; anterior eyes about half their diameter from the anterior carapacal margin and their own diameter from the posterior eyes; epistomal process relatively prominent and strongly acuminate (fig. 1, *e*); chaetotaxy of carapace 4-2 (16).

Tergites clearly tessellate distad of the marginal setae (in stained material); chaetotaxy (segments 1-12) 4:4:4:4:5:6:7:6:6:4:T2T:0. Sternites similar to tergites in sclerotization but tessellations less clearly defined; the fourth and fifth tergites more or less clearly divided by a nonsclerotic median area; chaetotaxy (segments 1-12) 0:10:6:6:9:9:9:9:9:3T1T3:0:2. Lateral marginal seta of sternites 5, 6, 7 markedly dwarfed; those of sternite 8 moderately reduced. Eleventh tergite and sternite fused to form a single cirumanal plate (fig. 1, *c*).

Genital area of female as illustrated (fig. 1, *d*).

Chelicerae of typical facies; galeal tubercle lacking; fixed finger with a median series of nine protrorse teeth, of which the distal is largest with the others becoming progressively smaller caudally; movable finger with a median series of 11 uniformly sized, slightly protrorse serrations; chaetotaxy normal, with a single small caudo-laterally situated accessory seta. Coxal area of usual facies; chaetotaxy 2-2-1:0-3-0:2-2-CS:2-3:2-3. Coxal spines comprising a subtransverse series of seven or eight, terminally and subterminally deeply incised, or frayed, ligulate blades.

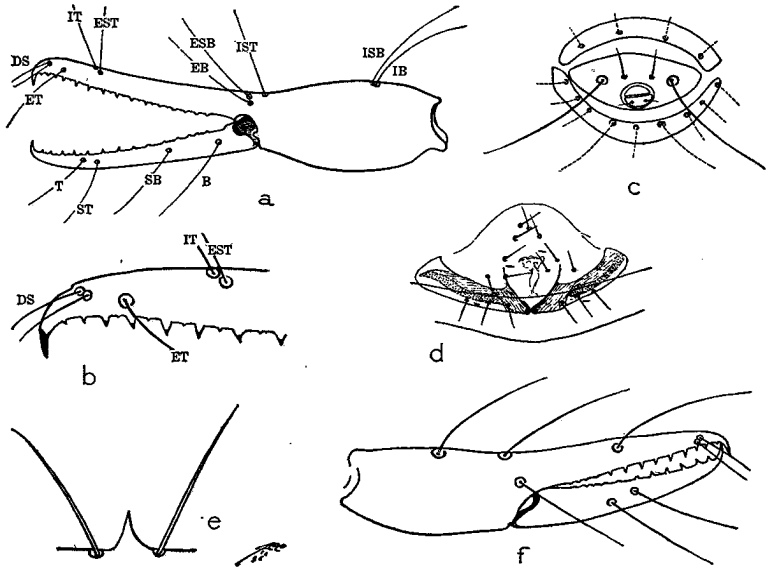

FIGURE 1.—*Tyrannochthonius chamorro* (from female holotype, except as otherwise indicated): **a**, exterior lateral aspect of left chela. **b**, tip of fixed finger of chela, showing detail of dentition. **c**, terminal aspect of abdomen, showing chaetotaxy of terminal segments [tergites 10, 11, and 12 (upper) and sternites 10, 11 and 12 (lower)]; chaetotaxal notation for tergites shown, 4:T2T:0; for sternites, 3T1T3:0:2 (diagrammatic sketch). **d**, genital area of female; opercular setae superimposed over internal genitalic sclerotizations (diagrammatic sketch). **e**, epistomal process and setae of carapace. **f**, exterior lateral aspect of right chela of deutonymph (paratype).

Palps slender; trochanter 1.78 times as long as broad; femur broadest subterminally and narrower medially than just distad of pedicel (gently concave in contour anteriorly and distinctly concave posteriorly), 4.59 times as long as broad; tibia of usual form, 1.94 times as long as broad; chela slender, orthodactylous and with contour of hand gently convex exteriorly and interiorly, 4.54 times as long as broad; hand 1.95 times as long as broad; fingers 1.32 times as long as hand. Fixed finger extends slightly beyond tip of movable finger.

Chaetotaxy and dentition of chela as illustrated (fig. 1, *a, b*); fixed finger with 15 large, spaced acuminate teeth (basal ones blunt but tips probably broken); very small and inconspicuous, microdenticles occur between the fourth to tenth macrodenticles (seven or eight microdenticles recognizable under high magnification); movable finger with 14 distinctly spaced macrodenticles, of which the basal four or five may be blunt rather than acuminate (but tips may have been broken from only available specimen); three or four very small but recognizable microdenticles can be observed between the second to fifth macrodenticles; fixed finger (of female at least) lacks a terminal sensorium adjacent to setae DS. Chela not distinctly heterodentate except under high magnification. Differentiated pseudotactile seta apparently lacking from base of fixed finger.

Legs of usual facies; fourth "miofemur" 2.39 times as long as deep; fourth tibia 4.43 times as long as deep; fourth telotarsus scarcely shorter than the tibia; miotarsus of leg I slightly longer than basifemur and distinctly shorter than fourth telotarsus.

Measurements (in millimeters). Female holotype (JC-2067.05001). Total length 1.18. Carapace 0.374 long, 0.382 broad across eyes and 0.367 broad posteriorly. Chelicera 0.331 long and 0.164 broad. Palps: trochanter 0.167 × 0.094; femur 0.464 × 0.101; tibia 0.206 × 0.106; chela 0.686 × 0.151 broad and 0.151 deep; hand 0.295 long; fingers 0.390 long; total length of palps 1.523. Leg I: basifemur 0.243 × 0.058; telofemur 0.125 × 0.048; tibia 0.137 × 0.037; miotarsus 0.250 × 0.032; total length of leg I (exclusive of trochanter and coxa) 0.755. Leg IV: "miofemur" 0.418 × 0.175; tibia 0.279 × 0.063; metatarsus 0.132 × 0.051; telotarsus 0.276 × 0.032; total length (exclusive of coxa and trochanter) 1.105.

Deutonymph. General facies those of the adult. Unfortunately the only specimen was badly damaged (accidentally crushed in course of preparation for study), and hence a detailed description is not possible. The palps are generally more robust than in the adult; the trochanter 1.67 times as long as broad; the femur 3.67 times as long as broad; the chela 4.55 times as long as deep; the finger 1.68 times as long as the hand. Chaetotaxy of carapace and abdomen not observable in present specimen. Chela as illustrated (fig. 1, *f*); chaetotaxy markedly reduced, the hand with a single dorsal seta (IB or ISB); the fixed finger with two basal and one median seta (homologies?); the movable finger with two median tactile setae (T and ST ?). The terminal diploid seta (DS) present as in adult. Chela not at all heterodentate, the fixed finger with 10 acute, spaced teeth and three blunt, basal ones (13 in all); the movable finger with seven spaced teeth, plus four or five nearly contiguous basal ones (11 or 12 teeth in all).

Measurements (in millimeters). Deutonymph (JC-2067.03001). Total length (estimated) about 0.6 mm. Carapace 0.18 long. Chelicera 0.15 long. Palps: trochanter 0.085 × 0.051; femur 0.162 × 0.044; tibia indet.; chela 0.259 × 0.057 deep, hand 0.114 long; fingers 0.191 long.

Holotype, female (JG-2067.05001), collected at Oca Point, Guam, October 12, 1945 by "Carver" (G. W. Wharton, Namru No. 1084). Paratype, deutonymph (JC-2067.03001) collected at the same locality on August 21, 1945 by "Fritts" (G. W. Wharton, Namru No. 750). (Bureau of Entomology and Plant Quarantine, lot no. 46-663.)

The only adult specimen available for study was markedly pallid in coloration, as though recently molted. It is closely related to the Philippine species *T. bakeri* J. C. Chamberlin, from which it differs most strikingly in the acuminate character of the epistomal process.

Family ATEMNIDAE J. C. Chamberlin

Oratemnus whartoni, new species (fig. 2, *a-e*).

Diagnosis. Small, light yellowish-brown species of typical facies; close to *O. bötcheri* Beier. Carapace smooth and polished, marked only by internal muscular insertion areas; distinctly longer than broad; no trace of eyes but with large, diffuse and noncorneate eyespots; lacking any trace of a transverse furrow; chaetotaxy about 4-8 (55).

Abdomen somewhat vermiform, when fully distended 2.5, or more, times as long as the carapace. Pleural membrane finely and evenly striate. First to third tergites entire, fourth partially divided, fifth to tenth more or less clearly divided into rectangular scuta by a linear stripe; eleventh tergite distinct and undivided (not fused with sternite 11).

Tergites smooth and only obscurely tessellate; evenly sclerotic distad of marginal setae but membranous caudad thereof; tergite 3 distinctly narrowed. Tergal chaetotaxy uniseriate on segments 1-3, averaging seven to nine (mean eight) marginal setae per tergite; segments 4-9 biseriate with six discal and seven to 12 (average, 8 to 10) marginal setae per tergite; tergites 10 and 11 irregularly biseriate, averaging a total of 16 to 18 setae on segment 10 and 12 to 14 on segment 11; dorsal half of anal operculum (reduced twelfth tergite) with the usual pair of microsetae. The lateral discal setae of tergite 9 are more elongate than usual and semitactile in nature; a lateral and submedian pair of the setae occurring on tergite 10 are differentiated as elongate, slender tactile setae while tergite 11 has a submedian pair of tactile setae and a lateral pair of moderately differentiated, pseudotactile or tactile setae.

Sternites similar to tergites in their sclerotization; four to 10 divided, 11 entire. Sternal chaetotaxy uniseriate medially except for the usual lateral discal seta which occurs on segments 5-8; segments 9-11 biseriate, with four discal setae each; the two lateral discal setae are semi-tactile in nature on segment 9; segment 10 has a lateral discal pair and a sublateral marginal pair (four in all) of tactile setae while segment 11 is characterized by a sublateral and a submedian pair of tactile setae. The marginal setae of sternites 4-10 number 11 to 14 per sternite and average about 12. Sternites 3 and 4 (the ones bearing the spiracles) are uniseriate, the setae numbering five or six and nine or 10 respectively, in the male, and nine or 10 on either segment in the female. The stigmatic plates each bear a single small seta.

The general appearance of the male genitalic structures is as illustrated (fig. 2, *a*). The female genital area is characterized by a short, median, unpaired tubular spermatic receptacle, measuring about 4 or 5 times as long as broad (0.092 mm. long by about 0.018 mm. broad). The male genital operculum is characterized by a diffuse scattering of bilaterally grouped setae which total 16 to 18 in number; in the female the opercular setae are divided bilaterally into two irregular groups and total 10 to 12 in number.

Chelicerae of usual facies; palm bearing only four setae (*is, ls, b* and *es*); *b* and *es* acute but with minute subterminal, lateral denticles. Fixed finger with four subterminal micro-serrations and four median, retrorse denticles which progressively decrease in size posteriorly; subapical lobe distinct. Lamina interior with dentate apical process and three dentate subapical lobes. Serrula interior with 19 to 21 blades. Flagellum of four blades of which the anteriormost is much the longest and characterized by four or five deep, anterior serrations; the second blade simple or with a single tooth; third and fourth blades acuminate. Galea of male stylet-like, with at most vestigial traces of the terminal branches; galea of female with six short, slightly recurved, simple, terminal and subterminal branches.

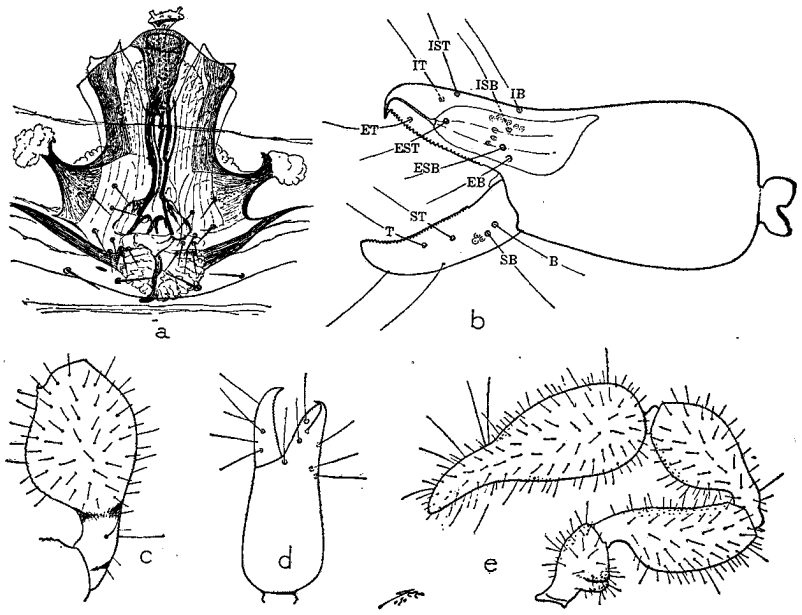

FIGURE 2.—*Oratemnus whartoni* (from male holotype, except as indicated): **a**, sketch of male genitalic structures with setae of opercula superimposed; chaetotaxal formula of latter: $\frac{(3)\ (3)}{(6)\ (6)}$. **b**, exterior lateral aspect of left chela, showing chaetotaxy, dentition, and venom apparatus (same scale as fig. 2, *d*). **c**, ventral aspect of left palpal tibia showing differentiation of pedicel. **d**, exterior lateral aspect of left chela of deutonymph, paratype (same scale as fig. 2, *b*). **e**, dorsal aspect of right palp.

Palps robust, of usual oratemnine facies, as illustrated (fig. 2, *e*); not markedly differentiated sexually. Derm smooth except for fine granulations on posterior and dorsal protuberances of trochanter, on the inner face of the femur and tibia and exteriorly and interiorly at the base of the fingers. Palpal proportions of holotype and male paratype (JC-2100.01001) respectively: trochanter with a prominent, conical, dorsal protuberance, 1.7-1.6 times as long as broad; femur strongly pedicellate, broadest proximad of median, and 2.34-2.23 times as long as broad; tibia rather slenderly pedicellate (fig. 2, *c*), the pedicel twice as long as its minimum breadth, about subequal in length to the femur, or to the hand plus its pedicel, and 2.09-2.12 times as long as broad; chela robust, distinctly deeper than broad (1.11-1.16 times), and 2.61-2.70 (plus pedicel 2.79-2.84) times as long as broad; hand 1.59-1.65 times as long as broad, and 1.49-1.48 times as long as the fingers; fingers 1.07-1.11 times as long as the breadth, and 0.96 as long as the depth, of the chela. Palpal proportions of female (allotype and paratype 2100.01003, respectively): trochanter 1.95-1.83 times as long as broad, dorsal process much less conspicuous than in the male; femur, 2.15-2.32 times as long as broad; tibia, 1.98-1.99 times as long as broad, tibial pedicel more robust than in male; chela 2.51-2.39 (plus pedicel 2.63-2.54) times as long as deep; depth of hand 0.98-1.08 times the breadth; hand 1.47-1.40 times as long as broad and 1.32-1.37 times as long as the fingers; fingers 1.12-1.02 times as long as the breadth, and 1.13-0.94 times as long as the depth, of the chela.

Chaetotaxy; venom apparatus and dentition of chela as illustrated (fig. 2, *b*), not significantly different in male and female. Movable finger ventrally with two prominent, pseudotactile setae, one between T and ST, the second subterminal and distad of T; with 30 to 36 well-developed, slightly retroconical, marginal teeth; with three or four sense spots exteriorly distad of, but close to, seta SB, none interiorly. Fixed finger lacking pseudotactile setae; venom duct 0.3-0.4 as long as the finger, the nodus ramosus distad of seta EST and about opposite seta IT; with three or four sense spots exteriorly and sub-basally (distad of EB and ESB) and with a linear series of six to nine similar spots interiorly between setae IB and IST; with about 27 to 29 well-developed, slightly retroconical marginal teeth.

Coxal area showing no features of particular interest, broadest medially; legs of normal facies, relatively robust; fourth femur and tibia lacking tactile setae; fourth tarsus with a slender sub-basal pseudotactile seta (0.08-0.11 of the tarsal length from its base). Legs not markedly differentiated sexually. Leg I: "miofemur" 2.75-2.85 times as long as deep; tibia 3.2-3.4 times as long as deep; miotarsus 4.1-4.3 times as long as deep. Leg IV: "miofemur" 2.7-2.9 times as long as deep; tibia 3.5-3.7 times as long as deep; tarsus 3.7-4.0 times as long as deep.

Measurements (in millimeters). Male (holotype and paratype JC-2100.01001, respectively). Total length (KOH cleared abdomen) 2.97-3.12; abdominal breadth 0.9. Carapace 0.77-0.74 long; ocular breadth 0.43-0.39; posterior breadth, 0.57-0.69.

Palps; trochanter 0.387-0.400 × 0.227-0.254; femur 0.640-0.623 × 0.274-0.279; tibia 0.653-0.663 × 0.312-0.313; chela 0.982-1.014 (with pedicel, 1.050-1.069) × 0.376 broad and 0.418-0.435 deep; hand 0.599-0.620 (with pedicel, 0.667-0.689) long; fingers 0.403-0.418 long. Venom duct 0.164-0.134 long. Total palpal length 2.730-2.755.

Leg I: "miofemur" 0.443-0.454 × 0.155-0.164; tibia 0.343-0.328 × 0.097-0.102; miotarsus 0.279-0.285 × 0.066. Total length of leg I, 1.065-1.067. Leg IV: "mio-

femur" 0.643-0.656 × 0.236-0.246; tibia 0.490-0.484 × 0.134-0.138; miotarsus 0.344 × 0.085-0.092. Tactile seta of tarsus 0.035-0.033 from base of segment; dorsal length of tarsus IV, 0.249-0.246. Total length of leg IV, 1.477-1.484.

Female (allotype and paratype JC-2100.01003, respectively). Total length (KOH cleared abdomen) 3.59-3.13; abdominal breadth about 0.9-0.8. Carapace 0.72-0.76 long; ocular breadth 0.41-0.40; posterior beneath, 0.66-0.59.

Palps: trochanter 0.394-0.361 × 0.203-0.197; femur 0.574-0.571 × 0.267-0.246; tibia 0.607-0.581 × 0.307-0.292; chela 0.977-0.918 (plus pedicel, 1.025-0.976) × 0.390-0.384 broad and 0.384-0.413 deep; hand 0.574-0.536 (plus pedicel, 0.640-0.599) long; fingers 0.435-0.390 long. Venom duct 0.131 long. Total palpal length 2.600-2.489.

Leg I: "miofemur" 0.421-0.415 × 0.153-0.148; tibia 0.312-0.320 × 0.098-0.095; miotarsus 0.267-0.274 × 0.066. Total length of leg I, 1.000-1.009. Leg IV: "miofemur" 0.659-0.640 × 0.233-0.218; tibia 0.472-0.459 × 0.136-0.130; miotarsus 0.320 × 0.087-0.082. Dorsal length of tarsus 0.230; tarsal tactile seta 0.025-0.033 from base of segment. Total length of leg IV, 1.451-1.419.

Deutonymph (JC-2067.01002). The single specimen available is almost certainly conspecific with the adult. General facies that of the adult but appendages, in general, more robust and chaetotaxy reduced; not clearly showing currently recognized generic characteristics. Carapace longer than broad; lacking transverse stripe or furrow; chaetotaxy about 5-3 (18).

Abdomen subvermiform as in adult; tergal and sternal division as in adult. Tergites and sternites completely uniseriate. Tergal chaetotaxy 4:4:5:6:6:6:6:6:6:2T2T2:1T2T1:2m. Sternal chaetotaxy (segments 2-12), 0:(1s)4(1s):(1s)4(1s):6:6:6:6:6:S1T2T1S:T1T2T1T:2m.

Chelicerae essentially as in adult including chaetotaxy; galea a long slender and nearly simple stylet (minutely branched); serrula exterior with 14 blades; flagellum as in adult, anterior blade with five deep, anterior unilateral serrations.

Palps similar in general appearance to those of adult, but pedicels of femur and tibia relatively much broader; almost, or quite, completely smooth on all surfaces. Trochanter 1.89 times as long as broad; femur 2.06 times as long as broad; tibia with pedicel thick and not differentiated exteriorly, 1.97 times as long as broad; chela 2.54 times as long as broad; hand 1.54 times as long as broad and 1.45 times as long as fingers; breadth and depth subequal; fingers slightly longer than breadth or depth of chela.

Chela with characteristically reduced chaetotaxy, as illustrated (fig. 2, *d*); movable finger with three pseudotactile setae, the median one of which is shorter and less clearly differentiated than the others; movable finger with 22 marginal teeth; fixed finger with about 16 marginal teeth; nodus ramosus median between setae ET and EST and opposite twelfth or thirteenth marginal tooth.

Measurements (in millimeters). Deutonymph. Total length 2.02. Carapace 0.476 long. Palps: trochanter 0.215 × 0.114; femur 0.272 × 0.132; tibia 0.283 × 0.144; chela 0.508 (plus pedicel 0.530) × 0.200 broad and 0.202 deep; hand 0.308 long; fingers 0.213 long. Total length of palps, 1.300. Leg I: "miofemur," 0.202 × 0.096; tibia 0.147 long; miotarsus 0.155 long. Total length of leg I, 0.504. Leg IV: "miofemur" 0.328 × 0.136; tibia 0.225 × 0.077; miotarsus 0.187 long. Total length of leg IV, 0.740.

Male holotype and deutonymph (JC-2067.01001 and 2), collected at Guam, Ylig Bay, by G. W. Wharton, August 2, 1945 (G. W. Wharton, Namru No. 720) (Bureau of Entomology and Plant Quarantine,

lot no. 46-663). Allotype, female (JC-2100.01002) and five male, four female and one nymphal paratypes (JC-2100.01001, and 3-11), collected at Guam, Mt. Alifan under bark of dead log, April 1946, by N. L. H. Krauss (no. 624).

This form is extremely close to the Philippine species *Oratemnus bötcheri* Beier, but differs in the shape of the tibia, the more attenuate fourth tibia and tarsus, and smaller size.

Family CHERNETIDAE Menge

Genus **Verrucachernes,** new genus

Diagnosis. Chernetine genus especially distinguished by the prominently verrucose or stellately granular pleural and interscleritic membranes (fig. 3, *c*).

Carapace broader than long, with median furrow distinct and prominent, posterior furrow absent or obsolescent; eyespots absent or obsolescent; vestitural setae short, thickened and terminally and subterminally denticulate. Abdomen rounded; posterior segments transverse; with two pairs of acuminate tactile setae on tergite 11 and four such setae on sternite 11. Tergites and sternites distinctly biseriate; tergal setae denticulo-clavate (fig. 3, *c*); sternal setae acuminate. Pleural and interscutal membranes prominently verrucose (fig. 3, *c*).

Female genital area of type illustrated for orthotype (fig. 3, *a*), with a single, unpaired, globular, seminal receptacle which arises from a rather short, median duct of moderate caliber.

Chelicerae of usual facies; setae *b* and *sb* thickened and terminally denticulate; galea branching (figs. 3, *b, i*); flagellum with three blades of which the anterior one only is dentate.

Palps moderately robust, granulate; femur and tibia pedicellate with femur broadest basally; vestitural setae thickened to moderately denticulo-clavate.

Chaetotaxy and dentition of chela as illustrated (fig. 3, *g*); sense spots reduced or absent; accessory teeth few in number (in the orthotype there are two sense spots on the fixed finger, while the accessory teeth number one or two on the movable, and two to three or four on the fixed, fingers respectively). Nodus ramosus slightly caudad of seta ST; seta T nearly median; ST closer to SB than to T; exterior setae of fixed finger normally distributed; seta IT submedian between ET and EST and with IST about opposite EST.

Legs of usual facies. Legs III and IV with tactile or pseudotactile setae absent from femur and tibia but miotarsus with a slender, acuminate, tactile seta about 0.33 of the tarsal length from its base (fig. 3, *h*); with a sense dome between tactile seta and base of the tarsus. Claws and subterminal setae of all legs normal and acuminate; arolia shorter than claws.

Orthotype, *Verrucachernes oca,* new species.

Verrucachernes is similar in some respects to the genus *Pychnochernes* but clearly different, the most distinctive feature being the strongly verrucose pleural and interscutal membranes in the present genus as contrasted with the smoothly plicate membranes of the

former. An undescribed, closely related species from the Philippine Islands is at hand.

Verrucachernes oca, new species (fig. 3, *a-i*).

Diagnosis (female only; male representative not available). Small species, the palps a light, reddish brown; carapace and tergites paler and yellowish in cast.

Carapace longer than broad, with a distinct, procurved submedian furrow; posterior furrow obsolescent and scarcely distinguishable; no eyes, and eyespots absent or obsolescent; finely and evenly but sparsely granulate except for central area of "ocular" and median discs which are nearly or quite smooth; vestitural setae, short, thickened, and terminally and subterminally denticulate; chaetotaxy approximately 8-10 (100).

Abdomen rounded, about twice as long as carapace; pleural and interscutal membranes densely, stellately wrinkled or papillate (fig. 3, *c*); tergites sparsely granulate or papillate; sternites relatively smooth but distinctly squamosely tessellate; tergal and sternal scuta not sharply differentiated from interscutal membranes, with which they more or less gradually merge (fig. 3, *c*). Tergal setae relatively short, thickened and terminally denticulate, except on tergite 11, where all are acuminate; all sternal setae acuminate.

Both tergites and sternites irregularly biseriate. Tergal chaetotaxy: $\frac{5}{10}:\frac{3}{13}:\frac{1}{14}:\frac{2}{16}:\frac{2}{10}:\frac{6}{12}:\frac{6}{13}:\frac{6}{12}:\frac{6}{12}:\frac{6}{10}:\frac{TT}{T5T}$: 2m. Sternal chaetotaxy (segments 2-12) : (12) : (1s)6(1s) : (2s)6(2s) : $\frac{0\text{-}2}{14}:\frac{0\text{-}3}{18}:\frac{6}{18}:\frac{6}{17}:\frac{5}{15}:\frac{5}{12}:\frac{TTTT}{4}$: 2m.

Genital area of female as illustrated (fig. 3, *a*); seminal receptacle an unpaired median structure comprising a relatively short, tubular duct and a very large globular reservoir. No distinct cribriform areas noted.

Chelicerae normally developed; palm with the usual setae (*ls, is, sb, b* and *es*) of which *sb* and *b* are laterally opposite, thickened and terminally denticulate; *es* apparently acuminate; galeal seta does not extend to tip of galea; galea with two main trunks, of which the basal one is two-branched while the other is four-branched; subapical lobe small, but distinct from dorsal aspect (fig. 3, *b, i*); flagellum three-bladed and only weakly denticulate anteriorly; serrula exterior 17-bladed; lamina interior with serrate apical process and with three dentate subapical lobes; fixed finger with a single subterminal denticle.

Palps relatively robust (fig. 3, *e*); femur distinctly pedicellate exteriorly and interiorly and broadest just beyond pedicel (sub-basally); tibia smoothly convex exteriorly, pedicel well differentiated interiorly; chela nearly bilaterally pedicellate; trochanter with a moderately developed, subconical dorsal protuberance (not visible in ventral aspect shown in figure). Palps evenly granulate except the chela (all parts) and the ventroexterior surfaces of the femur and tibia; vestitural setae of chela and exterior and ventral surface of tibia and femur moderately short and denticulo-acuminate; others, especially on inner and dorsal surfaces of femur, tibia and trochanter, moderately short, thickened and terminally denticulate. Trochanter 2.07 times as long as broad; femur slightly shorter than tibia and 2.25 times as long as broad; tibia 2.38 times as long as broad; chela 2.74 (with pedicel 2.92) times as long as broad; hand 1.52 times as long as broad; fingers slightly shorter than hand.

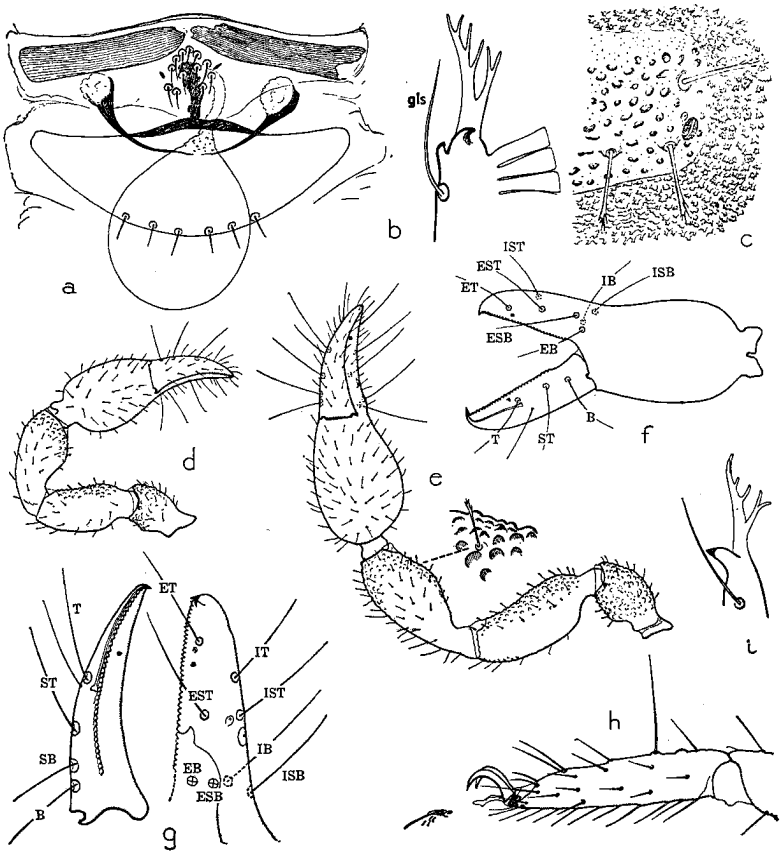

FIGURE 3.—*Verrucachernes oca* (from female holotype, unless otherwise indicated): **a,** sketch of female genital area, showing superimposed chaetotaxy of opercula [formula (12) : (6)] and seminal receptacle. **b,** dorsal aspect of right chelicera, showing galea and subapical tooth. **c,** median portion of ninth tergite, showing setae; granulation of scutum and interscleritic membrane (diagrammatic sketch). **d,** ventral aspect of right palp of tritonymph, paratype, JC-2067.04001 (same scale as fig. 3, *e*). **e,** ventral aspect of right palp (same scale as fig. 3, *d*). **f,** exterior lateral aspect of left chela of tritonymph, paratype, JC-2067.04001. **g,** movable and fixed finger of crushed left chela; position of setae EB and ESB approximate (reconstructed). **h,** lateral aspect of fourth miotarsus, showing pseudotactile seta. **i,** exterior lateral aspect of galea of left chelicera; subapical tooth not visible from this aspect.

Chela robust; chaetotaxy, dentition, and venom apparatus as illustrated (fig. 3, *g*); movable finger with about 38 well-developed, retroconical marginal teeth and a single large accessory tooth distad of seta T and opposite the thirteenth or fourteenth marginal tooth; venom duct elongate, the nodus ramosus slightly caudad of seta T and almost half as long as the finger (0.46); a relatively elongate semitactile seta occurs in close proximity to seta T. Fixed finger with 34 well-developed marginal teeth, with two large accessory teeth just caudad of seta ET and about opposite the twelfth and sixteenth marginal teeth respectively. Sense spot areas not developed, but two spots occur exteriorly on fixed finger caudad of seta IST.

Coxal area of typical appearance, broadest medially. Leg IV moderately robust; proximal segments dorsally with thickened, terminally dentate setae; no differentiated tactile or pseudotactile setae, except on the third and fourth tarsi where an elongate pseudotactile seta occurs distinctly proximad of median (0.34 of tarsal length from base), with a distinct sense dome proximad of tactile seta (0.21 of tarsal length from base) (fig. 3, *h*). Leg IV: "miofemur" 3.49 times as long as deep; tibia 3.64 times as long as deep; miotarsus 4.69 times as long as deep.

Measurements. Female holotype. Total length 1.46. Abdominal breadth about 0.57. Carapace, 0.48 long, about 0.38 broad medially and 0.36 broad posteriorly; "ocular" disc 0.27 long; median disc about 0.14 long; posterior disc, about 0.07 long. Palps: trochanter 0.246×0.119; femur, 0.328×0.146; tibia 0.364×0.153; chela 0.600×0.219; chela including pedicel, 0.640 long; hand 0.333 long; fingers 0.295 long. Total length of palps 1.578. Venom duct 0.136 long. Leg I: "miofemur" 0.246×0.082; tibia 0.181×0.052; miotarsus 0.208×0.041. Total length of leg I, 0.635. Leg IV: "miofemur" 0.359×0.103; tibia 0.251×0.069; miotarsus 0.255×0.048; tarsal base to tactile seta, 0.077, to sense dome, 0.048. Total length of leg IV, 0.835.

Tritonymph. General appearance that of adult female, except for size. Form of carapace as in adult; chaetotaxy reduced; about 6-9 (70-75). Abdomen much as in female, but biseriate character of chaetotaxy less distinct and quite irregular, setae fewer; tergal chaetotaxy: $11:\frac{0\text{-}2}{9 \text{ or } 10}:10:\frac{1\text{-}0}{9 \text{ or } 10}:\frac{2 \text{ or } 3}{7 \text{ or } 8}:\frac{4}{7 \text{ or } 8}:\frac{4 \text{ or } 5}{7 \text{ or } 8}:\frac{5 \text{ or } 6}{6}:\frac{5 \text{ or } 6}{6}:\frac{5 \text{ or } 6}{4 \text{ to } 6}:\frac{TT}{T4T}$: 2m. Sternal chaetotaxy (segments 2-12): (2) (2 or 3): (1s) 6 (1s): (2s) 5 (2s): $\frac{0\text{-}3 \text{ or } 4}{8 \text{ to } 11}:\frac{0\text{-}2 \text{ to } 4}{10 \text{ or } 11}:\frac{0\text{-}2 \text{ or } 3}{10 \text{ or } 11}:\frac{0 \text{ to } 1\text{-}2 \text{ or } 3}{10 \text{ to } 13}:\frac{0\text{-}2}{11}:\frac{4\,(?)}{7}:\frac{TTTT}{4}$: 2m.

Palps similar to adult, but pedicels of the various segments relatively broader and less clearly differentiated (fig. 3, *d*). Trochanter 1.62-1.78 times as long as broad; femur only slightly broadest basally, 2.02-2.03 times as long as broad; tibia 2.11-2.15 times as long as broad; chela 2.72-2.73 times as long as broad (with pedicel, 2.86-2.90 times); hand 1.48-1.49 times as long as broad and 1.17-1.18 times as long as fingers; breadth and depth of chela subequal.

Chela similar to that of adult except for the characteristically reduced chaetotaxy [setae ST (?) and IT absent], as illustrated (fig. 3, *f*); movable finger with 24 to 29 marginal teeth and one large accessory tooth interiorly and nearly opposite seta T and marginal tooth 14 or 15; fixed finger with 23 to 27 marginal teeth and a single large accessory tooth interiorly and slightly caudad

of seta ET and about opposite marginal tooth 11 or 12; venom duct elongate; the nodus ramosus about opposite seta T (0.51-0.42 of finger length from tip). Leg IV: "miofemur" 2.99-3.08 times as long as deep; tibia 2.97-3.19 times as long as deep; miotarsus 4.02-4.18 times as long as deep. Pseudotactile seta of tarsus IV, 0.34-0.36 of the tarsal length from its base; sense dome 0.20-0.23 from base.

Measurements. Tritonymph. (Those of specimen 2067.02002 given first; then those of specimen 2067.04001.) Total length, 1.15-1.34. Carapace, 0.360-0.410 long. Palps; trochanter 0.177-0.173 × 0.999-0.107; femur 0.210-0.235 × 0.104-0.116; tibia 0.236-0.264 × 0.110-0.125; chela 0.423-0.446 × 0.155-0.164; chela plus pedicel 0.443-0.476 long; hand 0.228-0.247 long; fingers 0.195-0.210 long. Depth of chela 0.155-0.167. Venom duct 0.099-0.088 long. Total length of palps 1.066-1.148. Leg I: "miofemur" 0.162-0.177 × 0.063-0.066; tibia 0.121-0.125 × 0.037 × 0.048; miotarsus 0.144-0.155 × 0.036-0.038. Total length leg I, 0.427-0.457. Leg IV: "miofemur" 0.228-0.254 × 0.074-0.085; tibia 0.169-0.184 × 0.053-0.062; miotarsus 0.169-0.184 × 0.042-0.044 Total length of leg IV, 0.566-0.622.

Holotype, female (JC-2067.02001) and paratype, tritonymph (JC-2067.02002), collected at Oca Point, Guam, August 10, 1945, by "Fritts" (G. W. Wharton, Namru No. 727). A second tritonymphal paratype (JC-2067.04001) was collected at the same locality, September 11, 1945 by G. W. Wharton (Namru No. 813). (Bureau of Entomology and Plant Quarantine, lot no. 46-663.)