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Notes on the Neotropical and Mexican Species of *Tetragnatha* (Araneae: Tetragnathidae) with Descriptions of Three New Species*

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Twenty species of the genus *Tetragnatha* are recognized to occur in the Neotropical and Mexican Regions. Three new species, *T. eberhardi*, *T. levii* and *T. paradoxa*, are described. Seventeen species, *T. boydi*, *T. caudata*, *T. cognata*, *T. confraterna*, *T. elongata*, *T. ethodon*, *T. gertschi*, *T. guatemalensis*, *T. jaculator*, *T. laboriosa*, *T. mabelae*, *T. mexicana*, *T. nitens*, *T. pallescens*, *T. pallida*, *T. sinuosa* and *T. tenuissima* are redescribed and illustrated. T. *jaculator* is recorded from the Neotropical Region for the first time.

INTRODUCTION

This paper is based on the specimens of *Tetragnatha* in the collection of the Museum of Comparative Zoology, Harvard University, which were sent to me for study by the courtesy of Dr. Herbert W. Levi of that museum. The pressent material containes about 2,500 specimens from Mexico, Guatemala, Honduras, Nicaragua, Costa Rica, Panama, Bahama Is., Cuba, Jamaica, Haiti, Dominica, Puerto Rico, Barbados and Trinidad-Tobago. These specimens are classified into 3 new species, 17 named-species and 6 species which are unable to determine mostly by lack of the male specimens.

One species may represent a new genus, the description of which, however, will be published in a separate paper.

The genus *Tetragnatha* Latreille, 1804 has been known by 26 species from the above region until Roewer (1942) published a "Katalog der Araneae". Later, Chickering (1957a, b, c, 1962) described 8 new species and newly recorded 1 species from this region. He also redescribed 20 species, based on the holotypes or "hypotypes" (which were not included in the original description but specimens identified later by the description). Thus, 35 species of *Tetragnatha* have been known from this region.

In this paper 3 new species are described, and one species, *T. jaculator*, is newly added to the fauna of this region. Seventeen species are redescribed, and the important morphological characters of them are illustrated.

Abbreviations used for the cheliceral armature are as follows :

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* Contribution from the Entomological Laboratory, Faculty of Agriculture, Kyushu University, Fukuoka (Ser. 4, No. 35).

a : An apophysis, for locking the female's fang during copulation.
Gu : The guide tooth of the upper row.
Gl: The guide tooth of the lower row.
T : The first (large) tooth of the row proper.
U2 : The next tooth of (Gu).
L2 : The next tooth of (Gl).
AXu: An auxiliary guide tooth of the upper row, present in some species.
AX1 : An auxiliary guide tooth of the lower row, present in some species.

Before going further, I wish to express my hearty thanks to Professor Emeritus Y. Hirashima of Kyushu University for the helpful suggestions and encouragement throughout the course of this work and to Professor K. Morimoto of Kyushu University for reading the manuscript of this paper. My heartful thanks are due to Dr. Herbert W. Levi of the Museum of Comparative Zoology, Harvard University, Cambridge, Masachusetts, U.S.A. for his kindness in offering me the important and interesting specimens for my study.

Key to the Species of the Neotropical *Tetragnatha* Based on the Male

1 Abdomen with a tail overhanging spinnerets ..... *caudata*
Abdomen without a tail 2
2 Conductor with pleats (Levi, 1981) lateraly 3
Conductor without pleats laterally 7
3 Abdomen elongate, more than 6 times as long as broad ..... *mexicana*
- Abdomen about 3-5 times as long as broad 4
4 Lateral eyes equal to, or more separated than median eyes 5
- Lateral eyes equal to, or closer than median eyes 6
5 Posterior row of eyes narrower than anterior row of eyes ..... *pallescens*
Two rows of eyes equal or subequal in width ..... *laboriosa*
6 (T) large ; paracymbium with tip rounded ..... *elongata*
(T) not so large ; paracymbium with tip pointed ..... *guatemalensis*
7 Tip of (a) bifurcated 8
- Tip of (a) simply pointed 13
8 Abdomen elongate, more than 6 times as long as broad ..... *tenuissima*
Abdomen about 3-5 times as long as broad 9
9 Chelicera without large (T), with three strong upper apical teeth 10
- Chelicera with large (T), without three strong upper apical teeth 11
10 (Gu) larger than (U2), directed forward ..... *boydi*
- (Gu) as large as or somewhat smaller than (U2), directed backward ..... *nitens*
11 Cheliceral fang with an inner cusp ..... *mabelae*
- Cheliceral fang without inner cusp 12
12 Lateral eyes more separated than median eyes ..... *jaculator*
- Lateral eyes closer than median eyes ..... *ethodon*
13 Abdomen elongate, about 9 times as long as broad ..... *pallida*
- Abdomen about 3-6 times as long as broad 14
14 Chelicera about 0.9 times as long as carapace ..... *confraterna*
Chelicera 0.4-0.7 times as long as carapace 15

15 Chelicera with a massive growth which is composed of two contiguous teeth on upper apical portion ..... *sinuosa*
- Chelicera not as above 16
16 Cheliceral fang with an inner cusp 17
- Cheliceral fang without inner cusp 18
17 Both conductor and embolus very long, narrowed near tips ..... *levii*
Both conductor and embolus rather thick, bluntly rounded at tips ..... *cognata*
18 Chelicera with strikingly thick and large (T) ..... *paradoxa*
- (T) not so large 19
19 First femora with 10-11 spines ; both conductor and embolus not so long, somewhat complicatedly twisted at the middle ..... *gertschi*
- All femora without spines ; both conductor and embolus somewhat long, moderately twisted at the middle ..... *eberhardi*

Tetragnatha boydi 0. Cambridge

(Fig. 1)

Tetragnatha boydi 0. Cambridge, 1898, Proc. 2001. Soc. London : 389 ; Okuma, 1983, Esakia, (20) : 70 ; Okuma, 1988, J. Fac. Agr., Kyushu Univ., 32 : 208.

Specimens examined : MEXICO : 1♀, 15.VI.1938 ; 5♀ & 1♂, 16.VI.1938 ; 1♀, 17. VI.1938, Nuevo Leon, Villa de Santiago, Hoogstrall, (Sweeping shrubs along streem). COSTA RICA : 1♂, Coris do Cartago, 11.X11.1962, P. J. Tonn ; 1♀, S. J. San Antonio

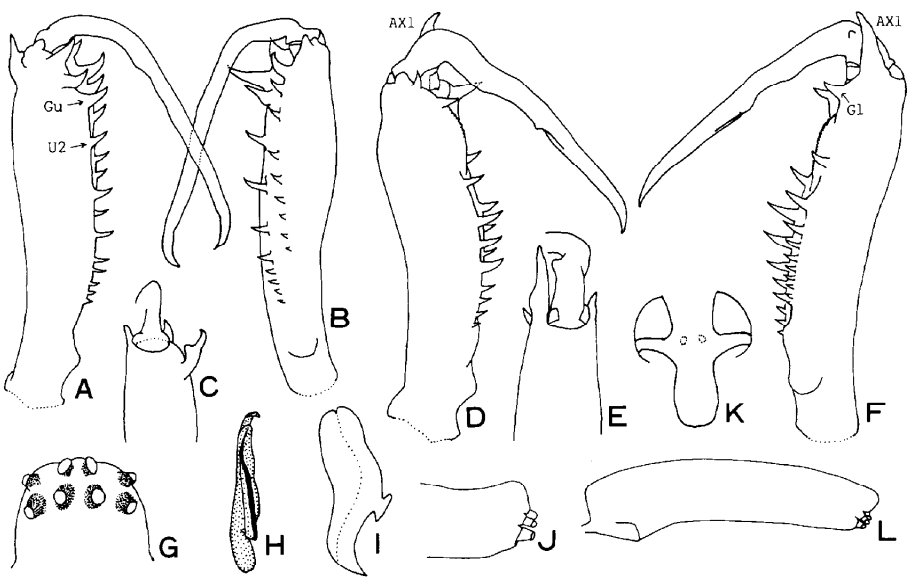

Fig. 1. *Tetragnatha boydi 0.* Cambridge. A : Left chelicera of male, upper view. B : Ditto, lower view. C : Ditto, lateral view. D : Left chelicera of female, upper view. E : Ditto, lateral view. F : Ditto, lower view. G : Eye group of male. H : Conductor and embolus of male. I : Paracymbium of male. J : Distal portion of abdomen of female. K : Genital fold of female. L : Abdomen of male, lateral view.

de Escazu, 1300m, 11.1981. PANAMA : 1 ♀, Chiriqui, Volcan. 1200m el., garden, 9.VIII. 1983 ; 1 ♀, Chiriqie Prov., La Fortuna 1100-1200 m, 5.1V.1984. JAMAICA : 1 ♂, Gayle webs near waterfall, 7.VI.1975, D. Randolph. PUERTO RICO : 1 ♂, Mayaguez, Univ. farm N of Univ. campus, 15.1.1964 ; Many specimens of both sexes, Jayuya, stream bed between coffee plantations, ca. 1000 m., 20-26.111.1986, H. L. Levi.

Leg formula 1. 2. 4. 3 ; all legs with spines, first femora with 14-18 spines in the male, 10-13 spines in the female ; body length : male 8.0-8.8 mm, female, 8.0-12.0 mm.

Distribution : Africa, Nepal, Brazil, Mexico, Costa Rica, Panama, Jamaica and Puerto Rico. This species was already known from Brazil (Okuma, 1983).

Note : This species is conspicuous by the apophysis (a) and the two contignous teeth on the chelicera in the male and the posterior cusp on the fang in the female. These characters, however, share with *T. nitens so* that the identification requires careful examination. This species is distinguished form the latter by the following features : (Gu) in the male larger than (U2) and directed forward, and (AXl) in the female longer and larger than (Gl) as shown in Fig. 1, A and F.

Tetragna th cauda ta Emerton

(Fig. 2)

Tetragnatha caudata Emerton, 1884, Trans. Connecticut Acad. Sci., 6 : 335 ; Levi, 1981, Bull. Mus. Comp. Zool., 149 (5) : 310.

Specimen examined : MEXICO : 1 ♀, just S of Tuxpan on HWY 180, Maria Barbara Cmpgd., 15-16.VII.1983, W. Maddison.

Body length : Female 7.7 mm.

Distribution : North and Central America.

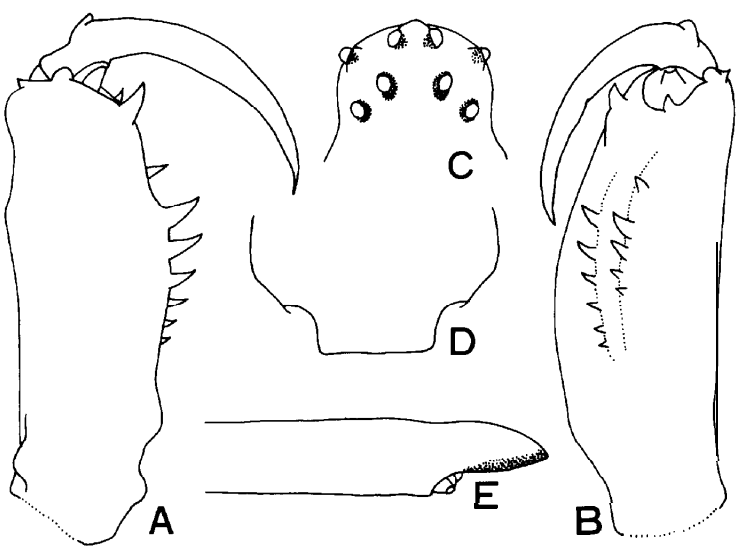

Fig. 2. *Tetragnatha caudata* Emerton, female. A : Left chelicera, upper view. B : Ditto, inner view. C : Eye group. D : Genital fold. E : Distal portion of abdomen, lateral view.

Note : Only one female specimen from Mexico is examined in the present study. This species has a small tail behind spinnerets.

Tetragnatha cognata 0. Cambridge

(Fig. 3)

Tetragnatha cognata 0. Cambridge, 1889, Biol. Centr. Amer. Aran., (1) : 7 ; F. P. - Cambridge, 1903, Biol. Centr. Amer. Aran., (2) : 433 ; Chickering, 1957c, Bull. Mus. Comp. Zool., 116 : 310.

Specimens examind : 3 ♀ & 1 ♂, PANAMA : Boquete, VIII.1950, Chickering.

Cheliceral fang in the male with a cusp on its inner margin near the base ; leg formula 1. 2. 4. 3 ; all legs with spines, first femora with 7-9 spines in the male, about 5 spines in the female ; body length : male 3.9 mm, female 4.7-5.0 mm.

Distribution : Guatemala and Panama.

Note : The present specimens of both sexes very well agree with Chickering's redescription and figures which were made based on the specimens from Boquete, Chiriqui.

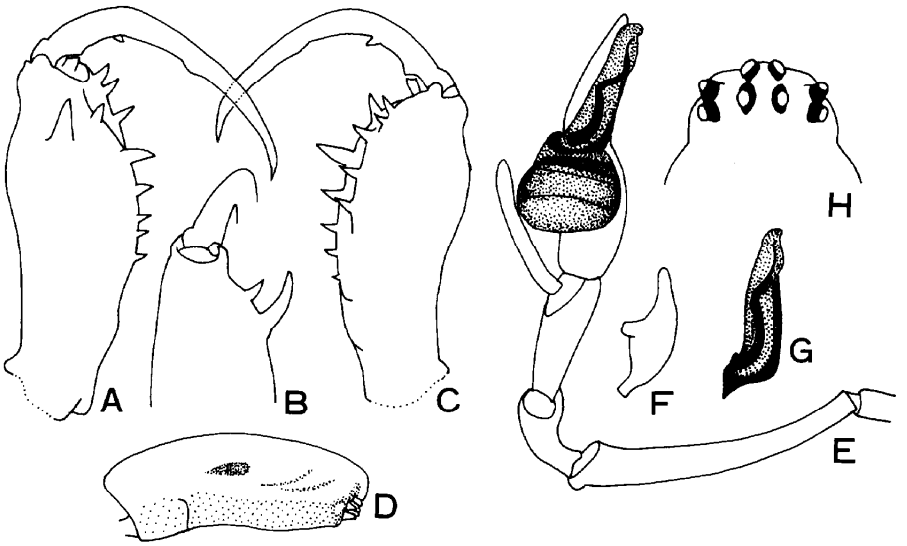

Fig. 3. *Tetragnatha cognata 0.* Cambridge, male. A : Left chelicera, upper view. B : Ditto, lateral view. C : Ditto, lower view. D : Abdomen, lateral view. E : Right palpus. F : Paracymbium. G : Conductor and embolus. H : Eye group.

Tetragna tha confra tema Banks

(Fig. 4)

Tetragnatha confraterna Banks, 1909, Proc. Ac. Nat. Sci. Philad. 61 : 207 ; Chickering, 1957c, Bull. Mus. Corn. Zool., 116 : 312.

Specimens examined : COSTA RICA : Many specimens of both sexes, Puntarenas

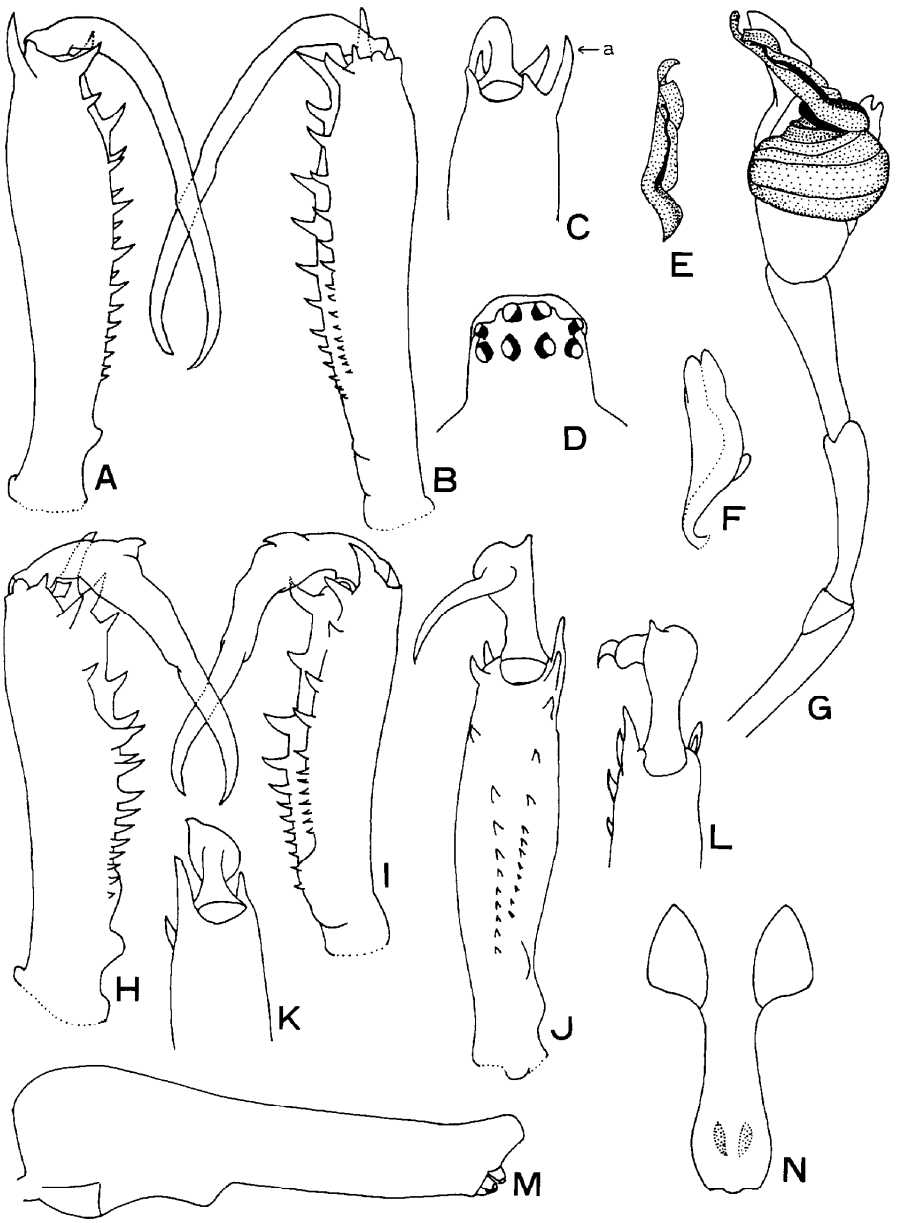

Fig. 4. *Tetragnatha confraterna* Banks. A : Left chelicera of male, upper view. B : Ditto, lower view. C : Ditto, lateral view. D : Eye group of male. E : Conductor and embolus of male. F : Paracymbium of male. G : Left palpus of male. H : Left chelicera of female, upper view. I : Ditto, lower view. J : Ditto, inner view. K & L : Ditto, lateral view. M : Abdomen of female, lateral view. N : Genital fold of female.

15 km ESE Potrero Granda, 27.1.1963, K. A. Arnold, Vegetation by stream ; 1♀ & 1 ♂, Guanacaste, Ca Canas 100 m, X1.1982, W. Eberhard ; 1♀, Puntarenses near Tarcoles Reserve Carara, 50 m, VIII.1983. PANAMA : 2♀ & 1♂, Chiriqui, 9 km N, David, river bed banks, 7.VIII.1983, J. Coddington ; 3♀, Chiriqi, near David, along river at night, W. Eberhard.

Leg formula 1. 2. 4. 3 ; all legs with spines, first femora with 11-15 spines in both sexes ; body length : male 8610.0 mm, female 11.0-13.0 mm.

Distribution : Costa Rica and Panama.

Note : This species was described by Banks (1909) from Costa Rica, but it was so incomplete with a simple figure of the male chelicera that the redescriptoption was given by Chickering (1957c). The above specimens of both sexes well agree with Chickering's redescription except the relative length of legs. The conspicuously developed chelicerae of both sexes are characteristic to this species. This species is related to *T. mandibulata* Walckenaer which widely occurs in Africa to S. E. Asia, Australia and Polynesia, but it may be barely distinguished from the latter by the female cheliceral fang.

Tetragna tha eberhardi sp. nov.

(Fig. 5)

Type material : Holotype 1 ♂ PANAMA : Chriqui Prov., La Fortuna 1100~1200 m., 5.1V.1984, W. Eberhard.

Type depository : The holotype is preserved in the collection of the Museum of Comparative Zoology, Harvard University.

This species is named after Dr. W. Eberhard who is the collector of this new species.

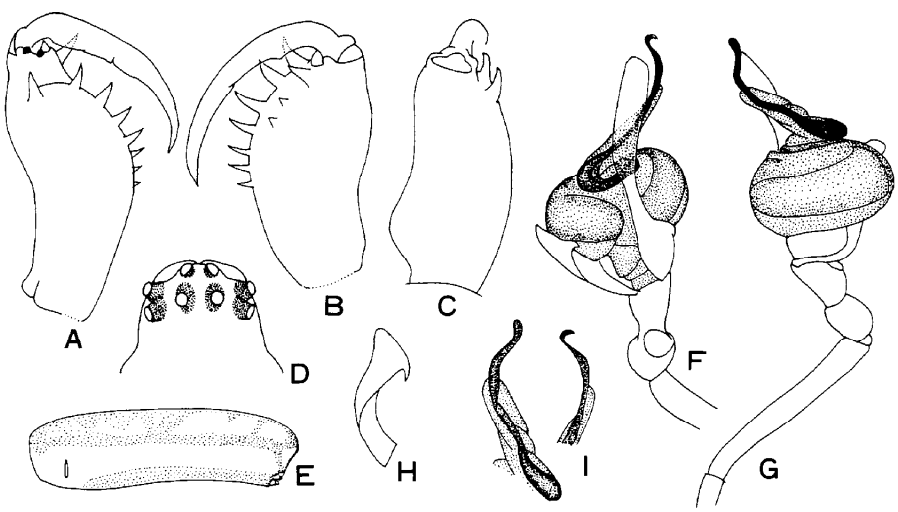

Fig. 5. *Tetragnatha eberhardi* sp. nov. (male). A : Left chelicera, upper view. B : Ditto, lower view. C : Ditto, lateral view. D : Eye group. E : Abdomen, lateral view. F & G : Left palpus. H : Paracymbium. I : Conductor and embolus.

Male. Body length, exclusive of chelicerae 3.8 mm ; carapacial length 1.5 mm, width 0.9 mm ; abdominal length 2.4 mm, width 0.8 mm ; cheliceral length 0.7 mm.

Eyes : Anterior row of eyes occupying full width of head, posterior row of eyes about as wide as anterior one ; viewed from above anterior row somewhat strongly recurved, posterior row moderately recurved, so that lateral eyes slightly closer than median eyes ; central ocular quadrangle with posterior ocular width larger than anterior ocular width (125 :100), and nearly equal to antero-postero-ocular length.

Chelicerae : Basal segment about 0.4 times as long as carapace ; fang unarmed.

Legs : Leg formula 1. 2. 4. 3 ; all legs with few weak spines, all femora without spines ; lengths of legs as shown in Table 1.

Table 1. *Tetragnatha eberhardi* sp. nov. Lengths (mm) of legs (male).

Legs	Femur	Patella + Tibia	Metatarsus	Tarsus	Total
I	2.50	3.00	2.30	0.83	8.63
II	1.90	2.10	1.60	0.60	6.20
III	1.10	0.95	0.80	0.40	3.25
IV	1.80	1.70	1.45	0.55	5.45

Palpi : Spherical tegulum distinctly large ; both conductor and embolus long, somewhat spiroid and hook-like at tip.

Abdomen : Not so long, less than 3 times as long as broad, distal end of abdomen somewhat overhanging spinnerets.

Color in alcohol : Legs and carapace yellow-blackish brown ; chelicerae, sternum, mouth parts and medial part of carapace darkended ; abdomen somewhat reddish brown, and with dusky markings and covered with sparse silvery spangles dorsally, somewhat dark ventrally.

Distribution : Panama.

Notes : This new species somewhat resembles *T. gertschi* Chickering, 1957 which was collected at the same time and the same place with this new species. But this species may be distinguished from the latter by the unarmed femora (with 10-11 spines in *T. gertschi*). And the male chelicerae and palpi are evidently different.

Te tragna tha elonga ta Walckenaer

(Fig. 6)

Tetragnatha elongata Walckenaer, 1805, Tabl. Aran. : 69 ; Levi, 1981, Bull. Mus. Comp. Zool., 149 (5) : 300.

Specimens examined : MEXICO : 1 ♀, Tamaulipas, Naciementa, Santa Engracia, 900 ft. el., 25.VI.1939, R. Haag ; 1 ♂, Yucatan, Chetumal, 28.VI.1975, W. Sedgwick ; 1 ♂, Tamaulipas, Naciementa, del Rel Rio Frio, near Gomez Farias, 99. 10w 231" N, 6-7.VI.1983 ; 1 ♀, Veracruz, 6 km NE of Coscomatepec on HWY 125, Ca 97" 02 'W 19" 07'N, Ca 3500 ft, 22.VI.1983, W. Maddison, M. Kaulbars & R. S. Anderson. COSTA RICA : 1 ♀, Puntarenas, Corcovado National Park, 11.1979, J. Coddington ; 1 ♂, Puntarenas, Ca Tarcoles, Reserva Carara, 20 m, 23.X1.1984. PANAMA : Many speci-

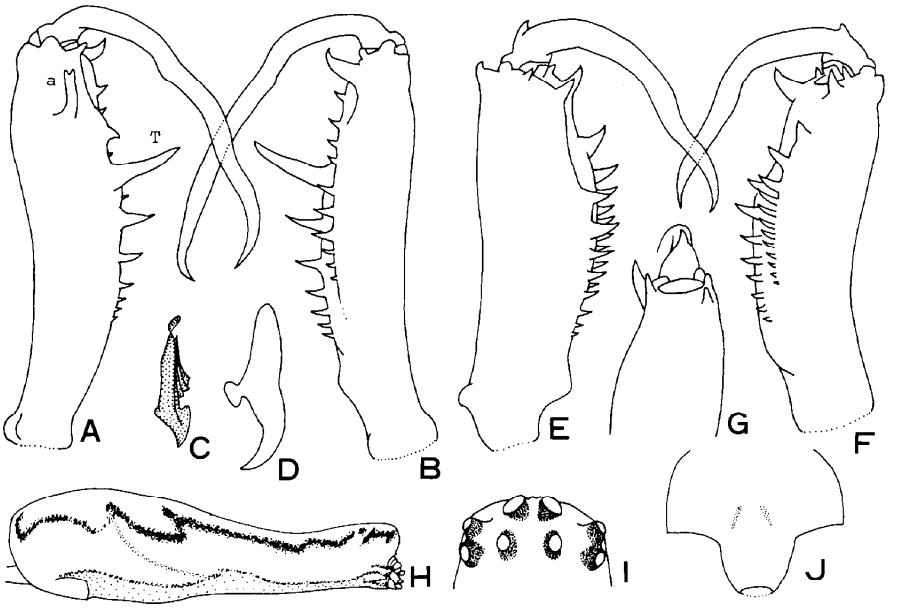

Fig. 6. *Tetmgnatha elongata* Walckenaer. A : Left chelicera of male, upper view. B : Ditto, lower view. C : Conductor and embolus of male. D : Paracymbium of male. E : Left chelicera of female, upper view. F : Ditto, lower view. G : Ditto, lateral view. H : Abdomen of female, lateral view. I : Eye group of male. J : Genital fold of female.

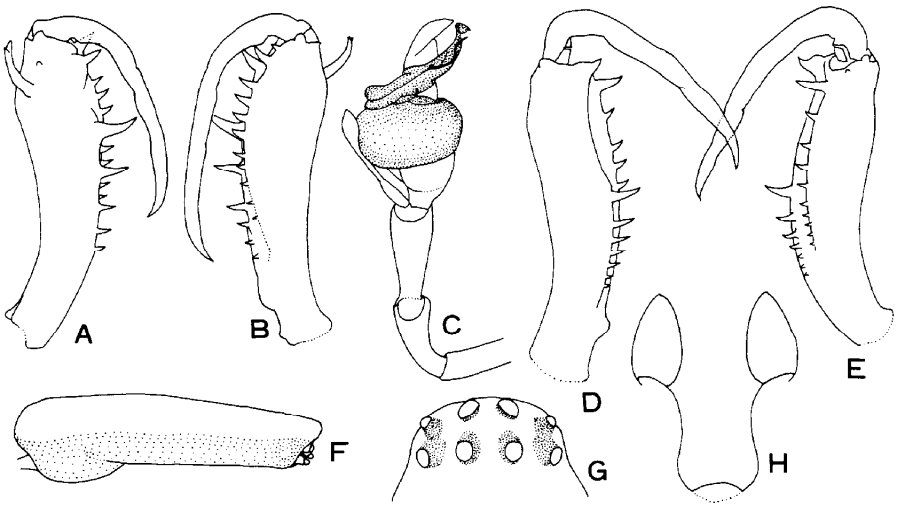

Fig. 7. *Tetragnatha ethodon* Chamberlin and Ivie. A : Left chelicera of male, upper view. B : Ditto, lower view. C : Right palpus of male. D : Left chelicera of female, upper view. E : Ditto, lower view. F : Abdomen of female, lateral view. G : Eye group of female. H : Genital fold of female.

mens of females, Barro Colorado Island, V.1964.

Leg formula 1. 2. 4. 3 ; all legs with spines, first femora with 12-16 spines in both sexes ; body length : male 5.0-10.0 mm, female 8.2-12.0 mm.

Distribution : North and Central America.

Note : This may be one of the most common species among American *Tetragnatha*. For the characteristics of this species see Levi (1981).

Tetragnatha ethodon Chamberlin and Ivie

(Fig. 7)

Tetragnatha ethodon Chamberin and Ivie, 1936, Bull. Univ. Utah Biol. 27 (5) : 64 ; Roewer, 1942, Katalog der Araneae, 1 : 989 ; Chickering, 1957c, Bull. Mus. Comp. Zool., 116 : 316.

Specimens examined : PANAMA : 2 ♂, Panama Canal Zone, Frijoles, 25.1.1958 ; 1 ♀, Panama Canal Zoone, Forest Preserve, 28.11.1958. PUERTO RICO : 1 ♀ & 1 ♂, Mayaguez, 5 km, N of city cane field, 4.11.1964 ; 36, Mayaguez, Univ. campus, 7.1. 1964 ; 1 ♀ & 1 ♂, Mayaguez, Univ. farm E of Nuc. ctr., 15.1.1964 ; 2 ♀ & 5 ♂, Mayaguez, Univ. farm N of campus, 1.1964. BARBADOS : 1 ♀, St. Vincent, 15-24.X. 1966. (?) : 1 ♀, St. Thomas.

Chelicerae in both sexes well developed, about 0.9 times as long as carapace ; (a) bifurcated at tip ; leg formura 1. 2. 4. 3 ; all legs with many spines, first femora with 10-20 spines in both sexes ; body length : male 6.0-6.7 mm, female 7.5-8.2 mm.

Distribution : Panama, Puerto Rico and Barbados.

Note : This species is very similar to *T. maxillosa* Thorell which widely occurs in Asia, New Guinea and Africa, and only separable from the latter by somewhat wider genital fold in the female (Fig. 7, H).

Te tragna tha gertschi Chickering

(Fig. 8)

Tetragnatha gertschi Chickering, 1957c, Bull. Mus. Comp. Zool., 116 : 321 ; Brignoli, 1983, Catalogue of Araneae, : 225.

Specimens examined : 1 ♀ & 1 ♂, PANAMA : Chiriqui Prov., La Fortuna 1100-1200 m, 5.1V.1984, W. Eberhard.

Male palpal spherical tegulum distinctly large ; posterior row of eyes slightly wider than anterior row (106 : 100) ; lateral eyes somewhat prominent laterally ; leg formula 1. 2. 4. 3 ; all legs with spines, first femora with 10-11 spines in both sexes ; chelicerae in the female about 0.5 times as long as carapace and without particular features ; body length : male 5.7 mm, female 6.3 mm.

Distribution : Panama.

Note : The specimens of both sexes well agree with Chickering's description and figures.

Tetragna tha gua temalensis 0. Cambridge

(Fig. 9)

Tetragnathu guatemalensis 0. Cambridge, 1889, Biol. Centr. Amer. Aran. (1) : 8 ; Levi,

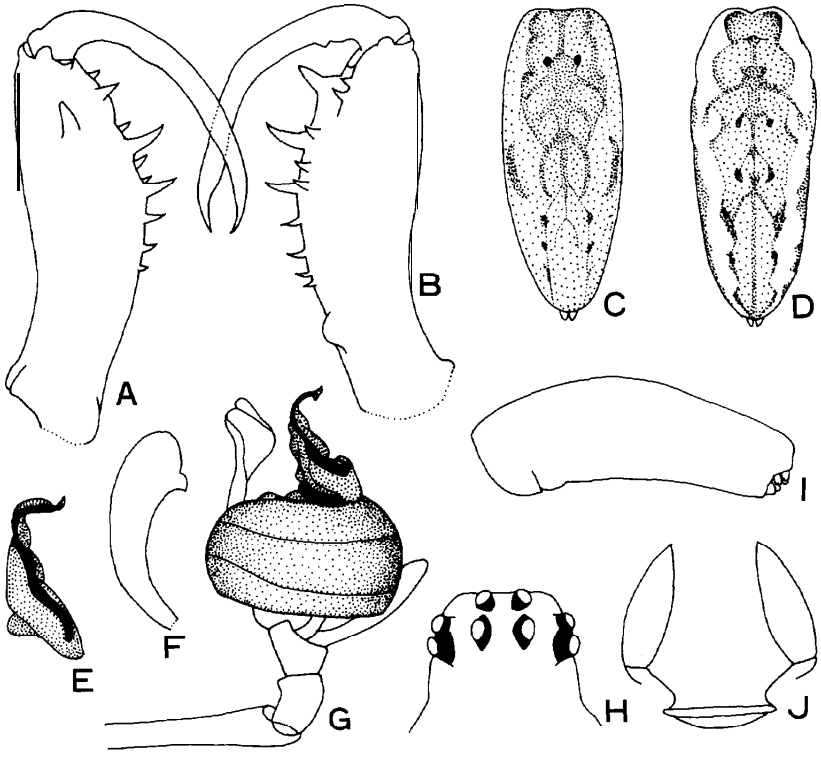

Fig. 8. *Tetragnatha gertschi* Chickering. A : Left chelicera of male, upper view. B : Ditto, lower view. C : Upper view of abdomen, male. D : Ditto, female. E : Conductor and embolus of male. F : Paracymbium of male. G : Left palpus of male. H : Eye group of male. I : Abdomen of male, lateral view. J : Genital fold of female.

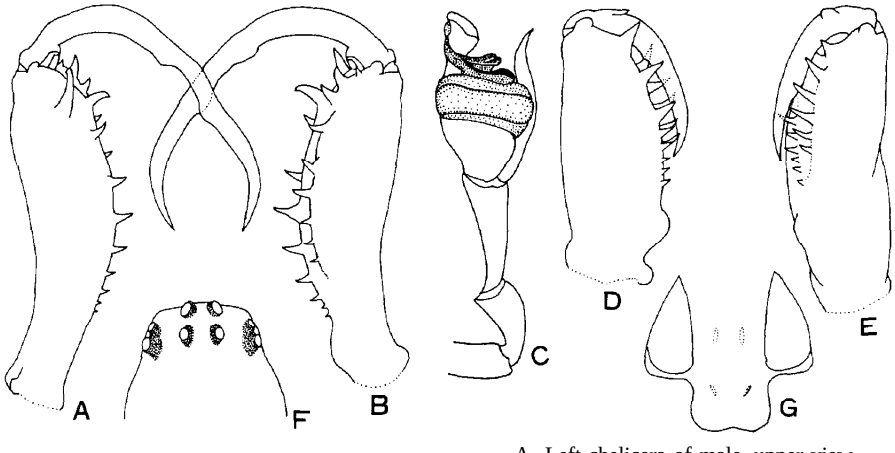

Fig. 9. *Tetragnatha guatemalensis* 0. Cambridge. A : Left chelicera of male, upper view. B : Ditto, lower view. C : Left palpus of male. D : Left chelicera of female, upper view. E : Ditto, lower view. F : Eye group of female. G : Genital fold of female.

1981, Bull. Mus. Comp. Zool., 149 (5) : 296.

Specimens examined : COSTA RICA : 1 ♀, Guanacaste OTS Finca Palo Verde, 27. 1.1979, J. Coddington. PANAMA : 4 ♀ & 3 youngs, Panama Canal Zone, near Miraflores Locks, 1.1.1958. CUBA : 3 ♀ & 1 ♂, Orient, Represe Cacoyocum, 11.1968, G. Agüeros. HAITI : 1 ♀, St. Marc, 1.1913, W. M. Mann.

Body length : Male 7.5 mm, female 9.8-11.0 mm.

Distribution : North and Central America.

Note : This species has been well known to occur in North and Central America. This species somewhat resembles *T. ceylonica* Cambridge which widely occurs in SE Asia to New Guinea.

Tetragnatha jaculator Tullgren

(Fig. 10)

Tetragnatha jaculator Tullgren, 1910, Aran. in : Sjöstedt Kilimand. Exped., 3 : 150 ; Okuma, 1984, Esakia, (2) : 87 ; Okuma, 1987, Esakia, (25) : 55 ; Okuma, 1988, J. Fac. Agr., Kyushu Univ., 32 : 194.

Specimens examined : BARBADOS : 1 ♂, St. Luca, 12.X.1966. TRINIDAD : 2 ♂, Part of Spain, X11-1.1913, R. Thaxter.

Posterior row of eyes somewhat narrower than anterior row of eyes (90-95 : 100), lateral eyes more separated than median eyes ; leg formula 1. 2. 4. 3 ; all legs with spines, first femora with about 5-8 spines ; paracymbium somewhat cubical and complicated ; spherical tegulum distinctly large, oval and slanting ; distal end of conductor and embolus simple ; body length : male 5.8-6.0 mm.

Distribution : Africa, SE Asia, New Guinea, Barbados and Trinidad Tobago.

Note : This species was described from Kilimanjaro, Africa and has been recorded

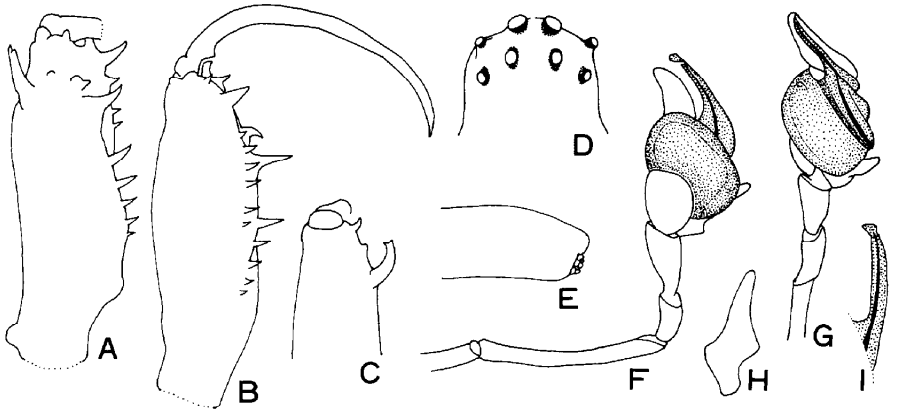

Fig. 10. ***Tetragnatha*** *jaculator* Tullgren, male. A : Left chelicera, upper view. B : Right chelicera, lower view. C : Left chelicera, lateral view. D : Eye group. E : Distal portion of abdomen, lateral view. F & G : Left palpus. H : Paracymbium. I : Conductor and embolus.

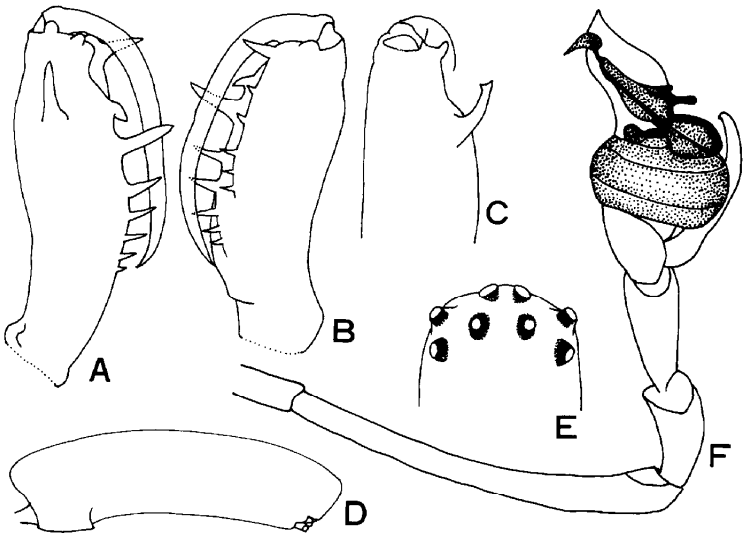

Fig. 11. *Tetmgnatha laboriosa* Hentz, male. A : Left chelicera, upper view. B : Ditto, lower view. C : Ditto, lateral view. D : Abdomen, lateral view. E : Eye group. F : Left palpus.

from SE Asia (Okuma, 1984) and New Guinea (Okuma, 1984, 1988). The present specimens well agree with the specimens form SE Asia. It is suggested here that *Tetragnatha argyrodes* Mello-Leitão, 1945 from Argentin and *Tetragnatha lewsisi* Chickering, 1962 from Jamaica, W. I. may be synonymous with this species.

Tetmgnatha laboriosa Hentz

(Fig. 11)

Tetragnatha laboriosa Hentz, 1850, J. Boston Soc. Nat. Hist., 6 : 27 ; Levi, 1981, Bull. Mus. Comp. Zool., 149 (5) : 308.

Specimens examined : MEXICO : 1 ♂, Soledad, 1-2.VIII.1934 ; 1 ♂, Jalisco, Guadalajara, 19.1X.1957 ; 1 ♀ & 1 ♂, K. 84 W of Toluca, ll.VIII.1964, J. Shetterly ; 1 ♀ & 1 ♂, Querétaro, 21.VIII.1984, C. Myers and L. Born. GUATEMALA : 1 ♂, Crampton Cooln. COSTA RICA : 1 ♂, Puntarenas Prov. Monteverde, VII.1978, C. L. Craig and P. Klass.

Body length : Male 6.0-6.8 mm, female 6.7-9.0 mm.

Distribuion : North and Central America.

Note : It seems that this is one of the most common *Tetragnatha* species in America, as is *T. elongata.*

Tetmgnatha levii **sp. nov.**

(Fig. 12)

Type material : Holotype 1 ♂ MEXICO, Michoacan, Tancitaro 6500 ft. elev., VII, VIII.1940, H. Hoogstrall.

Type depository: The holotype is preserved in the collection of the Museum of Comparative Zoology, Harvard University.

This species is named in honor of Dr. Herbert W. Levi of the Museum of Comparative Zoology, Harvard University.

Male. Carapacial length 1.7 mm, width 1.1 mm ; abdomen damaged ; cheliceral length 1.0 mm.

Eyes : Anterior row of eyes occupying full width of head, posterior row of eyes slightly wider than anterior row of eyes (106 : 100); postero-median eyes more separated than antero-median eyes ; lateral eyes closer than median eyes, central ocular quadrangle with posterior ocular width larger than anterior ocular width (136 : 100), and slightly larger than antero-posterior ocular length (109 : 100) ; ratio of diameters of AME : ALE : PME : PLE as 100 : 66 : 105 : 105.

Chelicerae : Basal segment about 0.6 times as long as carapace ; fang with an inner cusp near base as shown in Fig. 12, B.

Legs : Leg formula 1. 2. 4. 3 ; all legs with spines, first femora with 8 spines ; lengths of legs as shown in Table 2.

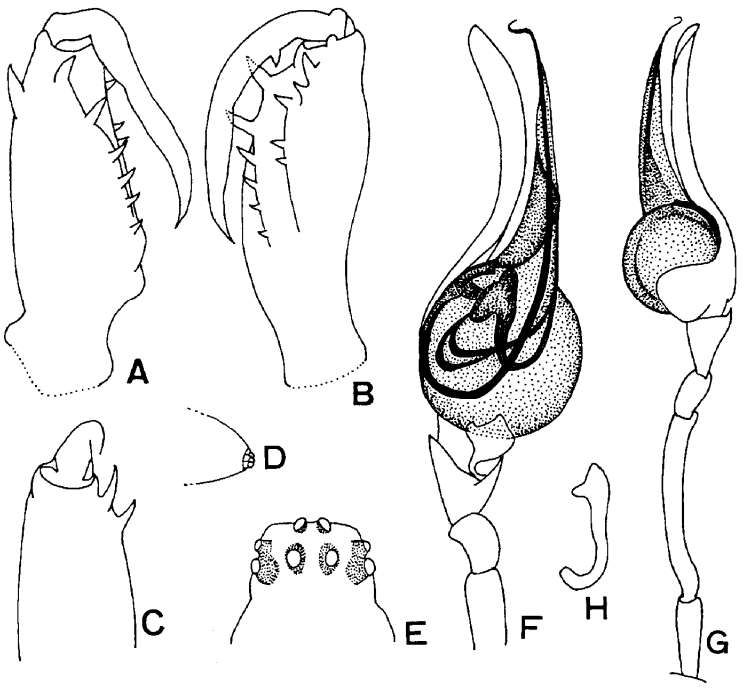

Fig. 12. *Tetragnatha levii* sp. nov. (male). A : Left chelicera, upper view. B : Ditto, lower view. C : Ditto, lateral view. D : Distal portion of abdomen, lateral view. E : Eye group. F & G : Right palpus. H : Paracymbium.

Table 2. *Tetragnatha levii* sp. nov. Lengths (mm) of legs (male).

Legs	Femur	Patella+Tibia	Metatarsus	Tarsus	Total
I	4.00	4.60	4.30	1.15	14.05
II	2.70	2.75	2.35	0.75	8.55
III	1.20	1.15	1.00	0.40	3.75
IV	2.70	2.40	2.35	0.65	8.10

Palpi: Paracymbium long, a small lobe situated near apex ; both conductor and embolus very long, and narroded near apex.

Abdomen : Damaged ; but the distal portion not extended posteriorly to spinnerets.

Color in alcohol : Generally light yellowish brown ; carapace and chelicerae somewhat dark.

Distribution : Mexico.

Note : This new species may be easily distinguished from other species in the genus by the characteristic male palpal conductor and embolus.

Te tragna tha mabelae Chickering

(Fig. 13)

Tetragnatha mabelae Chickering, 1957c, Bull. Mus. Comp. Zool., 116 : 330 ; Brignoli, 1983, Catalogue of Araneae, : 225.

Specimen examined : TRINIDAD : 1 ♂, Simla, Arima Vally, 20.1V.1964.

Cheliceral (a) bifurcated at tip, fang with a small inner cusp ; leg formula 1. 2. 4.

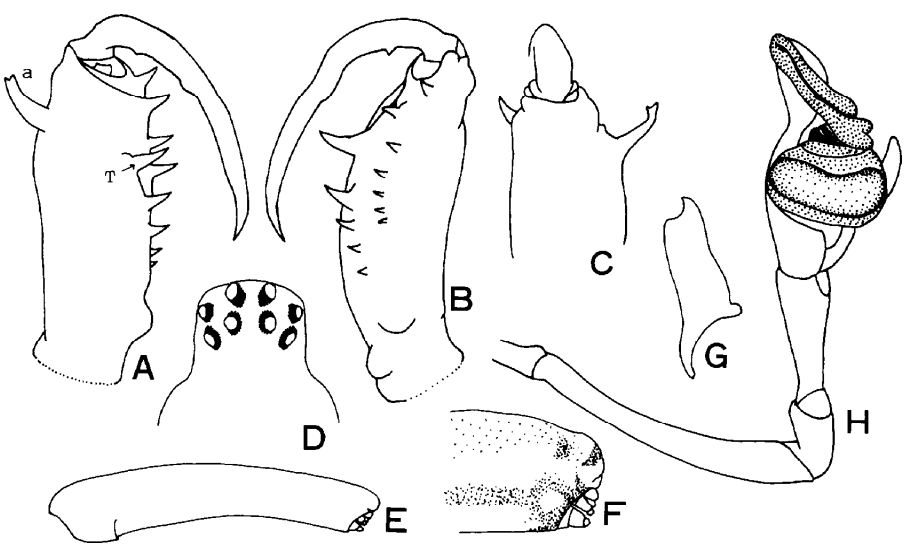

Fig. 13. *Tetragnatha mabelae* Chickering, male. A : Left chelicera, upper view. B : Ditto, lower view. C : Ditto, lateral view. D : Eye group. E : Abdomen, lateral view. E : Ditto, distal portion. G : Paracymbium. H : Left palpus.

3 ; all legs with spines, first femora with 8 - 10 spines ; abdomen moderately long, about 5.2 times as long as broad ; body length : male 5.8 mm.

Distribution : Panama and Trinidad.

Note : This species was described from Panama, in 1957. Since then, no record has been made. The present material from Trinidad very well agrees with Chickering's description and figures.

Tetragna tha mex icana Keyserling

(Fig. **14)**

Tetragnatha mexicana Keyserling, 1865, Verh. 2001. Bot. Ges. Wien, 15 : 858 ; F. P. Cambridge, 1903, Biol. Centr. Amer. Aran., 2 : 434 ; Roewer, 1942, Katalog der Araneae, 1 : 990 ; Chickering, 1957c, Bull. Mus. Comp. Zool., 116 : 333.

Tetragnatha longa 0. Cambridge, 1889, Biol. Centr. Amer. Aran., 1: 9..

Tetragnatha apheles Chamberlin and Ivie, 1936, Bull. Univ. Utah, 27 (5) : 64.

Specimens examined : MEXICO : 1 ♂, Veracruz, Acayucan, 26.X.1957, R. R. Dreisbach ; 1 ♂, Jalapa, No date of col. (N. Banks). HONDURAS : 2 ♀ & 2 ♂, Tela 26.VII.1929, (no good specimens).

Posterior row of eyes slightly wider than anterior row of eyes (107 : 100) ; lateral eyes as separated as median eyes ; leg formula 1. 4. 2. 3 ; all legs with spines, first femora with about 7 spines in the male ; abdomen long, about 7-8 times as long as

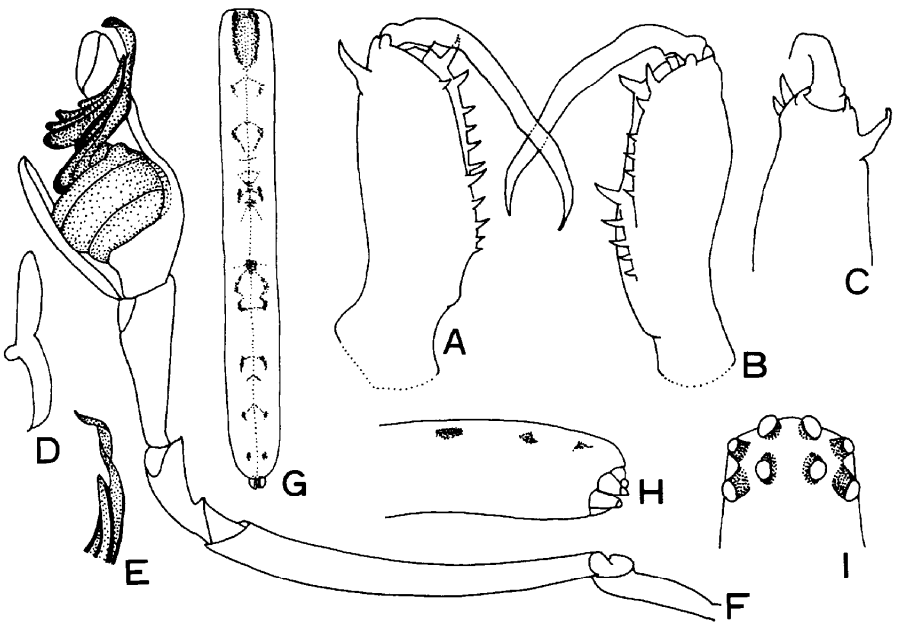

Fig. 14. *Tetragnatha mexicana* Keyserling, male. A : Left chelicera, upper view. B : Ditto, lower view. C : Ditto, lateral view. D : Paracymbium. E : Distal portion of conductor and embolus. F : Right palpus. G : Abdomen, upper view. H : Ditto, distal portion, lateral view. I : Eye group.

broad ; male palpal conductor with conspicuous pleats (Levi, 1981) ; body length : male 7.6-8.8 mm.

Distribution : Mexico and Honduras.

Note : The present specimens very well agree with Chickering's redescription and figures which were made based on the specimens from Barro Colorado Island, C. Z. The materials from Honduras are all broken, so that the detailed observation of them, specially of the female, is impossible.

Tetragnatha nitens (Audouin)

(Fig. *15)*

Eugnatha nitens Audouin, 1827 Explic. Planch. Arachn. in : Savigny, Desc. de l'Egypt, 22 : 323.

Tetragnatha nitens Levi, 1981, Bull. Mus. Comp. Zool., 149 (5) : 291 ; Okuma, 1983,

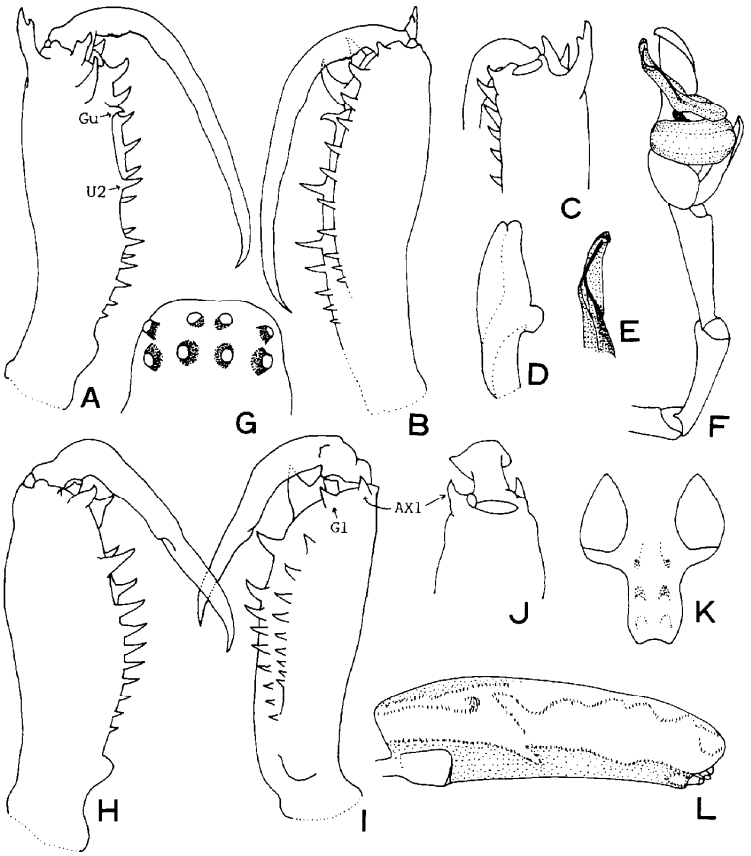

Fig. 15. Tetragnatha nitens (Audouin). A : Left chelicera of male, upper view. B : Ditto, lower view. C : Ditto, lateral view. D : Paracymbium of male. E : Distal portion of conductor and embolus of male. F : Left palpus of male. G : Eye group of male. H : Left chelicera of female, upper view. I : Ditto, lower view. J : Ditto, lateral view. K : Genital fold of female. L : Abdomen of male, lateral view.

Esakia, (20) : 75 ; Okuma, 1987, Esakia (25) : 84 ; Okuma, 1988, J. Fac. Agr., Kyushu Univ., 32 (34) : 207.

Specimens examined : MEXICO : 1 ♀, Acapulco Pic de la Caestel, Wetground, 18-19.X11.1944, S. Jones. BAHAMA IS. : 1 ♀, Grand Bahama, Freeport, V.1965, A. Spielman. VIRGIN IS. : Many specimens of both sexes, St. John, Cruz Bay, 5.111.1964 ; Many specimens of both sexes, St. John, Cruz Bay, 27, 28.IV.1964, Chickering. CHILE ; Many specimens of both sexes, 15 km. North of Panamerican Highway, L. Cartagena, 28.X.1973, E. Perez.

Body length : Male 8.0-9.0 mm, female 9.0-11.0 mm.

Distribution : Pantropical and Pansubtropical.

Note : This species has been well known to occur in the tropical and subtropical parts of the world. This species is conspicuous in having the apophysis (a) and the two contignous teeth on the chelicera in the male and the diagnostic posterior cusp on the fang in the female. These characters are very similar to those of *T. boydi, so* that the two species may frequently be confused. In this species, (Gu) in the male as large as or somewhat smaller than (U2) and directed backward, and (AXl) in the female as large as (Gl) as shown in Fig. 15, A and I.

Tetragnatha pallescens F. Cambridge
(Fig. 16)

Tetragnatha pallescens F. Cambridge, 1903, Biol. Centr. Amer. Aran., (2) : 434, 436 ; Levi, 1981, Bull. Mus. Comp. Zool., 149 (5) : 308.

Specimens examined : COSTA RICA : 1 ♂, Guanacste Prov., 6 MI. S. 6 MI. W. Canas, Taboga 10°19'N, 85°09'W, 3-12.11.1967, J. Nelson. PANAMA : 2 ♀ & 3 youngs, El Volcān, II.1936 ; 1 ♀, Canal Zone, Barro Colorad Island, VIII.1939, A. M. Chickering ; 1 ♀ & 2 youngs, Canal Zone, Barro Colorad Island, VII.1954. CUBA : 2 ♂, Oriente, Represa, Cacoyocum, 11.1968, G. Agüeros. JAMAICA : 1 ♀, 7 ♂ & many youngs, St. Mary Par. Green Castle, Pond edge, 27.111.1972, H. & L. Levi. VIRGIN IS. : 1 ♂, St. Croix, 111.1964.

Body length : Male 6.6-8.8 mm, female 12.0-13.2 mm.

Distribution : North and Central America and West Indies.

Note : This species has been well known to occur in North and Central America and West Indies.

Tetragnatha pallida O. Cambridge
(Fig. 17)

Tetragnatha pallida 0. Cambridge, 1889, Biol. Centr. Amer. Aran., (1) : 10 ; F. P. - Cambridge, 1903, Biol. Centr. Amer. Aran., (2) : 435 ; Banks, 1929, Bull. Mus. Comp. Zool., 69 : 90 ; Roewer, 1942, Katalog der Araneae, 1 : 990 ; Chickering, 1957c, Bull. Mus. Comp. Zool., 116 : 338.

Specimens examined : COSTA RICA : 1 ♀, Puntarenas, Osa Pen. Sirena 10 m, II. 1984, W. Eberhard. PANAMA : 1 ♀, Panama Canal Zone, Barro Colorado I., 30.VIII. 1950 ; 1 ♂, Panama Canal Zone, Barro Colorado I., 19.VII.1954. (?) : 1 ♀, Nathan Banks

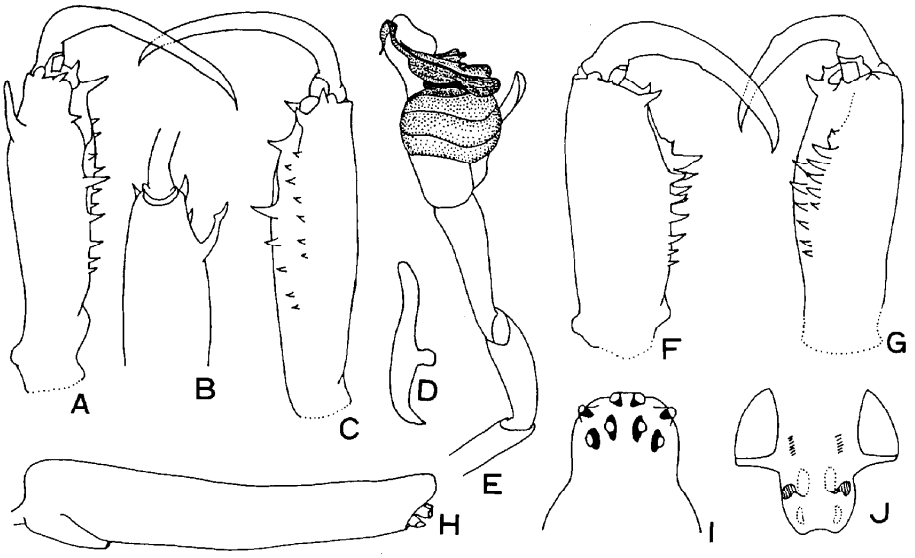

Fig. 16. *Tetragnatha pallescens* F. Cambridge. A : Left chelicera of male, upper view. B : Ditto, lateral view. C : Ditto, lower view. D : Paracymbium of male. E : Left palpus of male. F : Left chelicera of female, upper view. G : Ditto, lower view. H : Abdomen of female, lateral view. I : Eye group of male. J : Genital fold of female.

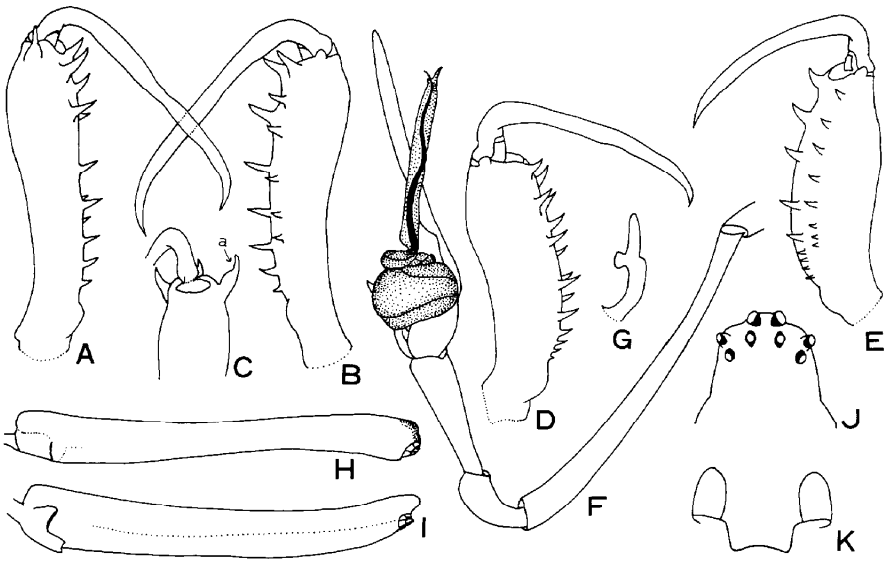

Fig. 17. *Tetragnatha pallida 0.* Cambridge. A : Left chelicera of male, upper view. B : Ditto, lower view. C : Ditto, lateral view. D : Left chelicera of female, upper view. E : Ditto, lower view. F: Right palpus of male. G : Paracymbium of male. H : Lateral view of abdomen, male. I : Ditto, female. J : Eye group of female. K : Genital fold of female.

Coll.

Posterior row of eyes evidently narrower than anterior row ; whole body long and slender ; male chelicera as long as carapace ; abdomen about 9 times as long as broad in the male, 5-7 times as long as broad in the female ; leg formula 1.2.4.3 in both sexes ; all legs with spines, first femora with stout 16 spines in the male, 10-14 spines in the female ; body length : male 9.2 mm, female 6.8-9.0 mm.

Distribution : Panama.

Note : The present specimens of both sexes well agree with Chickering's redescription and figures which were made based on the specimens from Canal Zone Forest Reserve. This species is related to *T. rubriventris* Doleschall from New Guinea and Australia.

Tetragnatha paradoxa sp. nov.

(Figs. 18 & 19)

Type material : Holotype 1 ♂ COSTA RICA, San Isidro del General. 2000-4000 ft elevation, no other data. Paratypes : 1 ♀, same data as holotype ; 1 ♂, San Isidro del General, 2000-4000 ft. (Dean Rounds) ; 1 ♀, San Jose Prov. Bajo Hondura, in Parque B. Carillo 1360 m, 1.1983, W. Eberhard.

Type depository : The holotype is preserved in the collection of the Museum of Comparative Zoology, Harvard University.

This new species is named for somewhat strange feature in this genus.

Male. Body length, exclusive of chelicerae 3.7 mm ; carapacial length 1.3 mm, width 0.7 mm ; abdominal length 2.4 mm, width 0.7 mm ; cheliceral length 0.7 mm.

Eyes : Anterior row of eyes occupying full width of head, posterior row of eyes as

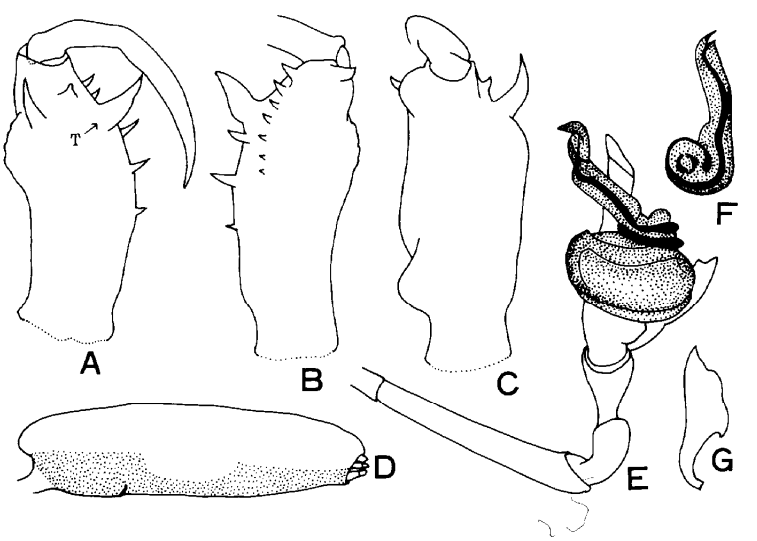

Fig. 18. *Tetragnatha paradoxa* sp. nov. (male). A : Left chelicera, upper view. B : Ditto, lower view. C : Ditto, lateral view. D : Abdomen, lateral view. E : Left palpus. F : Conductor and embolus. G : Paracymbium.

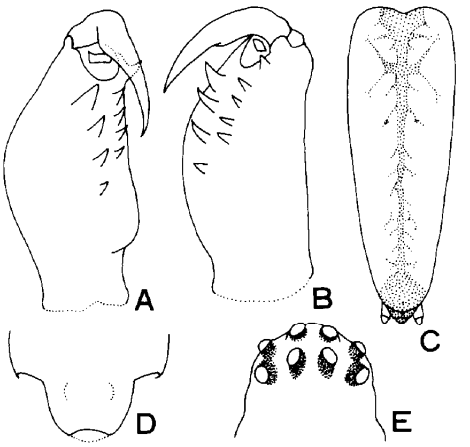

Fig. 19. *Tetragnatha paradoxa* sp. nov. (female). A: Left chelicera, upper view. B: Ditto, lower view. C: Abdomen, upper view. D: Genital fold. E: Eye group.

wide as anterior one; viewed form above, two rows nearly parallel and moderately recurved; central ocular quadrangle nearly square ; ratio of diameters of AME: ALE : PME : PLE as 100 : 67 : 100 : 83.

Chelicerae : Basal segment about 0.5 times as long as carapace ; large tooth (T) strikingly large and thick ; fang unarmed.

Legs : All damaged ; all legs without spines. Based on a paratype male, leg formula 1. 2. 4. 3 ; all legs without spines ; lengths of legs as shown in Table 3.

Table 3. *Tetragnatha paradoxa* sp. nov. Lengths (mm) of legs (male).

Legs	Femur	Patella + Tibia	Metatarsus	Tarsus	Total
I	3.00	3.20	2.95	0.80	9.95
II	1.65	1.50	1.35	0.48	4.98
III	0.80	0.65	0.60	0.35	2.40
IV	1.70	1.40	1.40	0.42	4.92

Palpi: Both conductor and embolus rather thick, somewhat spiroid and twisted at tip.

Abdomen : moderately long, about 3.7 times as long as broad, not extended posteriorly to spinnerets.

Color in alcohol : Generally brown to reddish brown ; abdomen covered with many yellowish silvery spangles dorsally, without any spangles ventrally.

Female. Body length, exclusive of chelicerae 4.0 mm; carapacial length 1.4 mm, width 0.8 mm ; abdominal length 2.6 mm, width 0.9 mm ; cheliceral length 0.5 mm.

Eyes : Anterior row of eyes occupying full width of head, posterior row of eyes slightly wider than anterior one (103 : 100) ; others nearly as in male.

Chelicerae : Basal segment about 0.4 times as long as carapace ; fang unarmed.

Legs : Leg formula 1. 2. 4. 3 ; all legs without spines ; lengths of legs as shown in Table 4.

Table 4. *Tetragnatha paradoxa* sp. nov. Lengths (mm) of legs (female).

Legs	Femur	Patella+Tibia	Metatarsus	Tarsus	Total
I	2.85	3.25	3.10	0.80	10.00
II	1.60	1.55	1.40	0.50	5.05
III	0.80	0.65	0.55	0.35	2.35
IV	1.70	1.40	1.35	0.45	4.90

Abdomen : Not so long, less than 3 times as long as broad.

Color in alcohol : Similar to male.

Distribution : Costa Rica.

Note : This new species is distinctive in the genus, and it may be easily distinguished from other *Tetragnath* species.

Te tragna tha sinuosa Chickering

(Fig. 20)

Tetragnatha sinuosa Chickering, 1957c, Bull. Mus. Comp. Zool., 116 : 340.

Specimen examined : PANAMA : 1 ♂, Panama Canal Zone, Summit Gardens, 12. VIII.1954, Chickering.

Chelicera with a massive growth which is composed of two contiguous teeth on the upper apical portion ; leg formula 1. 2. 4. 3 ; all legs with spines, first femora with 9 spines ; abdomen moderately long, about 4.3 times as long as broad ; body length : male 3.9 mm.

Distribution : Panama.

Note : This species was described from Panama in 1957. Since then, no record has been made. The present one male specimen from the type locality very well agrees with Chickering's description and figures.

Te tragna tha tenuissima 0. Cambridge

(Fig. 21)

Tetragnath tenuissima 0. Cambridge, 1889, Biol. Centr. Amer. Aran., (1) : 9 ; F. Cambridge, 1903, ditto, (2) : 432 ; Petrunkevich, 1930, Trans. Connect. Ac. Sci., 30: 279 ; Bryant, 1940, Bull. Mus. Comp. Zool., 86 : 367 ; Chickering, 1957c, ditto, 116: 344 ; Chickering, 1962, ditto, 127 : 447.

Specimens examined : MEXICO : 1 ♀ & 1 ♂, Tamaulipas, Naciemente del Rio Frio, near Gōmez Farias, near 99.1°W'23.1°N, 6-7.VI.1983 ; 1 ♀, Veracruz, Las Tuxtla, 15 km N Catemaco 50 m, VIII.1986, W. Eberhard. GUATEMALA : 1 ♂, Tikal, 7.VII. 1975, W. Sedgwick. COSTA RICA : 2 ♂, Limōn, Cahuita, 30.111.1979, J. Coddington ; 1 ♀, San Jose, 30.VII.1980 ; 1 ♀ & 1 ♂, Heredia ca. Puerto Viejo, La Selva, 50 m, XII. 1980 ; 1 ♀, Heredia "La Selva" near Puerto Viejo, 100 m, II.1981 ; 1 ♀, Heredia, La

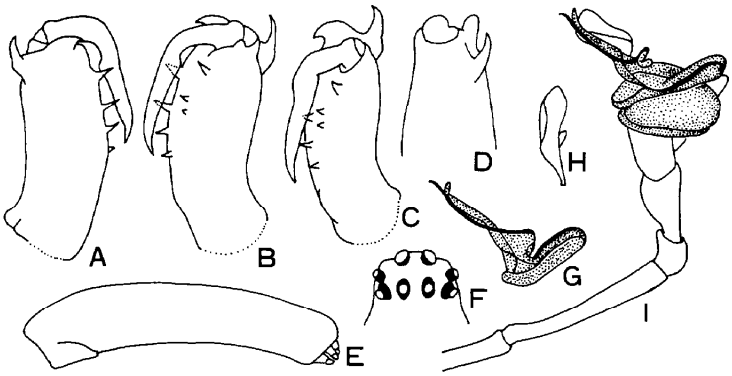

Fig. 20. *Tetragnatha sinuosa* Chikering, male. A : Left chelicera, upper view. B & C : Ditto, lower view. D : Ditto, lateral view. E : Abdomen, lateral view. F : Eye group. G : Conductor and embolus. H : Paracymbium. I : Left palpus.

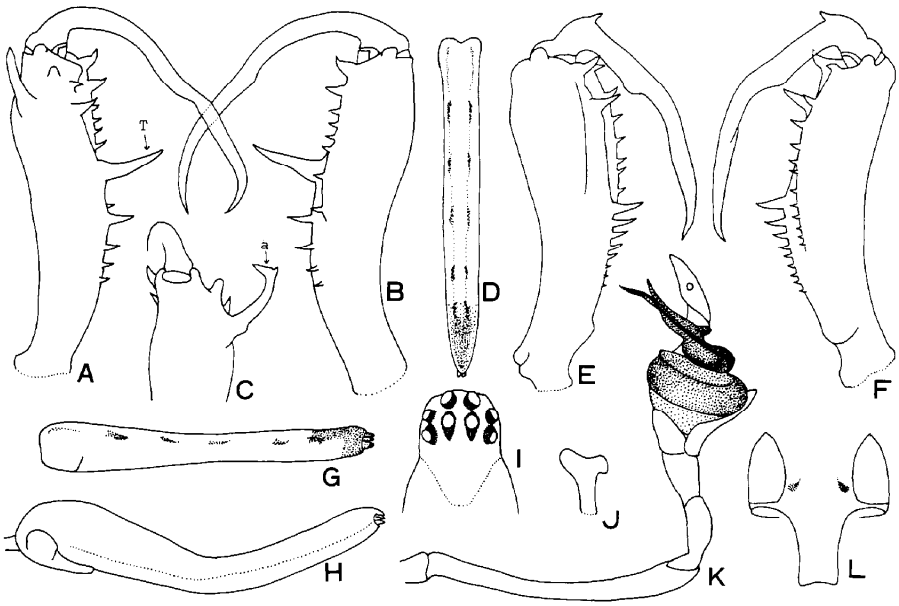

Fig. 21. *Tetragnatha tenuissima 0.* Cambridge. A : Left chelicera of male, upper view. B : Ditto, lower view. C : Ditto, lateral view. D : Abdomen of male, upper view. E : Left chelicera of female, upper view. F : Ditto, lower view. G : Lateral view of abdomen, male. H : Ditto, female. I : Eye group of male. J : Paracymbium of male. K : Left palpus of male. L : Genital fold of female.

Selva nr. Puerto Viejo 100 m, X11.1982, W. Eberhard ; 1♀, Puntarenas Corcovado-Sirena 10 m, 111.1984, W. Eberhard ; 3♀ & 1♂, Puntarenas, ca. Tarcoles. Reserva Carara, 20 m, 23.X1.1984 ; 1♀, San José Prov., San Antonio de Escazu, 1.300 m, VIII. 1986, W. Eberhard. PANAMA : 1♀, Panama Canal Zone, Frijoles. 25.1.1958 ; 1♀ & 5♂, Panama Canal Zone, Barro Colorad Is., 1X.1975, W. Eberhard; 1♀, Panama Canal Zone, Barro Colorad Is., II.1977 ; 1♀, Gatun Lake, Barro Colorad Is., 11.1982, C. L. Craig ; 1♂, ditto, 30.1V.1982, C. L. Craig ; 1♀, Chiriqui, near David., along river at night, VIII.1983, W. Eberhard. CUBA : 1♂, No precise location, 1967, P. Alayo. PUERTO RICO : Many specimens of both sexes, Mayagüez, Univ. farm N of campus, I.1964 ; 1♂, Cord. Central Area Recreo Dona Juana Weeds, Old parking lot, 24.111.1986, H. L. Levi ; Many specimens of both sexes, Jayuya, stream bed between coffee plantations, Ca. 1000 m, 20-26.111.1986, H. L. Levi.

Leg formula 1. 4. 2. 3 in both sexes ; all legs with weak spines (or bristles ?), and the spines variable in number, first femora with l-8 spines in the male, l-2 spines in the female. Abdomen elongate, about 7-9 times as long as broad in the male, 6-7 times as long as broad in the female ; body length : male 5.6-8.2 mm, female 8.0-9.6 mm.

Distribution : Mexico to Central America.

Note : This species seems to be the commonest *Tetragnatha* in the Central America, particularly in Costa Rica, Panama and Puerto Rico. The present specimens of both sexes well agree with Chickering's redescription and figures which were made based on the specimens from Barro Colorado Island, C. Z.

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