

New Records of Five Orb-web Spiders of the Genera *Leucauge*, *Mesida*, and *Eriovixia* (Araneae: Tetragnathidae and Araneidae) from Taiwan

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Abstract — Five orb-weaving species of the families Tetragnathidae and Araneidae are newly recorded from Taiwan. These include tetragnathid species *Leucauge argentina* (Hasselt 1882), *L. tessellata* (Thorell 1887), *Mesida gemmea* Hasselt 1882 and araneid species *Eriovixia excelsa* (Simon 1889), *E. sakiedaorum* Tanikawa 1999. The tetragnathid genus *Mesida* is recorded from Taiwan for the first time. The morphology of these five orb-weaving species are described and illustrated, and the synonyms and distribution accounts are given in this paper.

Key words — *Eriovixia excelsa*, *Eriovixia sakiedaorum*, *Leucauge argentina*, *Leucauge tessellata*, *Mesida gemmea*, Taiwan, new records

Introduction

Among around three hundred species of spiders recorded from Taiwan (Chen 1996), cribellate orb-weavers (family Araneidae and Tetragnathidae) have received relatively greater attention. Although census methods such as pitfall trapping have been gradually adopted in the current investigation of Taiwanese spider fauna, in the past few decades most of the collections were performed by visual inspection. With this method, orb-weaving spiders are easier to be located and collected than other Araneae taxa, because orb web construction not only makes the spiders more conspicuous, but also restricts their movement (Robinson & Robinson 1974). Therefore, although araneids and tetragnathids are not particularly speciose among the fifty thousand or so Araneae species documented (Foelix 1996), they were always the most substantial group in several surveys on Taiwanese fauna conducted by various authors (Lee 1964, Chu & Okuma 1974, 1975, Chen 1996). In Taiwan, compared with other taxa such as ground spiders, orb weavers' diversity is better understood and the report of new or new record species becomes quite infrequent in recent years. Unlike ground-dwelling spiders such as Amaurobiidae in which the number of species can abruptly increase due to an adoption of new collecting techniques [e.g., Wang and Ono (1998) found 9 species of coelotine spiders from mountainous areas of Taiwan by leaf-sifting, and Wang and Tso (submitted) found three more by pit-fall trapping], the discovery of novel orb-weaving species can only be achieved by inspecting areas that has received relatively little attention in the past.

Currently, in contrast to regions west of the central mountainous area, all the other parts of Taiwan have received far less exploration in spider diversity. In the past few years we have concentrated our efforts in these areas, I-Lan, Huwa-Lian, Tai-Tung and

Ping-Yung County and islands off the southeast coast of Taiwan such as Orchid Island, and have found five orb-weaving species that were previously not recorded from Taiwan: three tetragnathids (genera *Leucauge* and *Mesida*) and two araneidids (genus *Eriovixia*). The tetragnathid genus *Mesida* is recorded from Taiwan for the first time. In this paper, we will describe and illustrate those five species and also give their synonyms and distribution accounts. The specimens examined in this study are deposited in Department of Biology, Tunghai University (THU) and Department of Zoology, National Science Museum, Tokyo (NSMT).

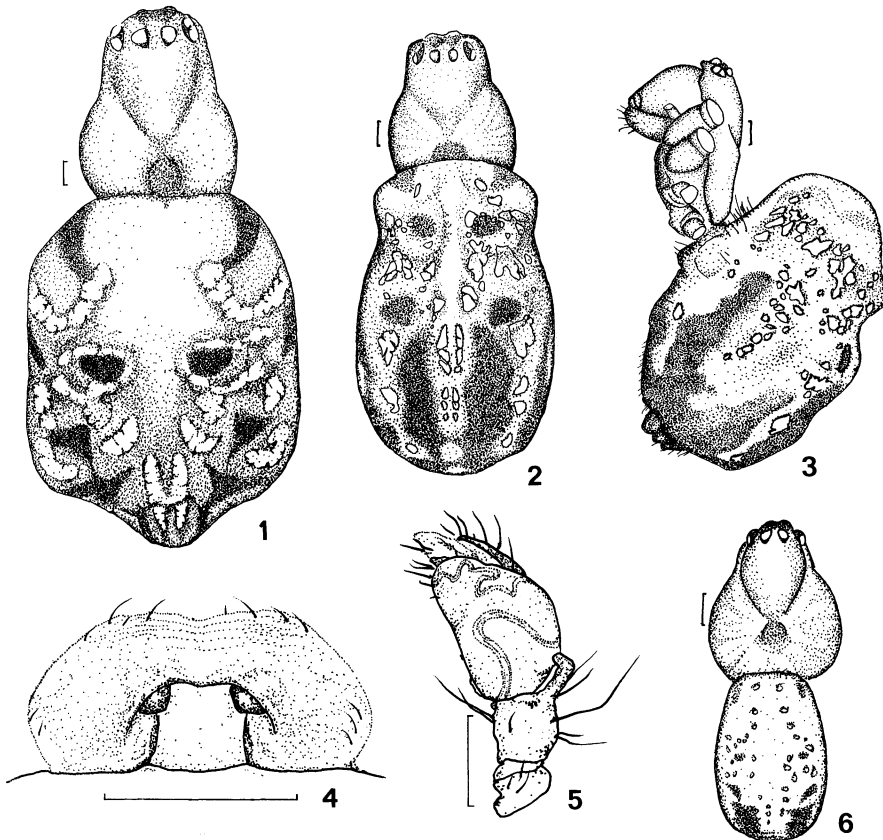
Family Tetragnathidae
Leucauge argentina (Hasselt 1882)

Figs. 1-6

Theridion argentinum Hasselt 1882, p. 34.

Argyropeira argentina: Thorell 1890, p. 199; Workman, 1896, p. 54.

Leucauge argentina: Koh 1989, p. 56; Barrion & Listinger 1995, p. 543.



Figs. 1-6. *Leucauge argentina* (Hasselt 1882) — 1, Female carapace and abdomen dorsal view; 2, same (another female); 3, same, lateral view; 4, epigynum, ventral view; 5, male left palp, lateral view; 6, male carapace and abdomen, dorsal view. (Scales 0.25 mm.)

Specimens examined. 1 ♀, Yung-Hsing Farm, Lanyu, 14-IV-1997 (THU-Ar-980001), 3 ♀, Chung-Ai bridge, Lanyu, Taitung County, Taiwan, 15-II-1997 (THU-Ar-980002-980004); 1 ♂, same locality, 16-IV-1997 (THU-Ar-980005); 1 ♂, same locality, 9-XII-1997 (THU-Ar-980006), Taitung County, Taiwan; all specimens were collected by I.-M. Tso.

Description. Measurements (in mm, using a female and a male from Lanyu, Taiwan). Total length ♀ 4.34, ♂ 2.60. Carapace length ♀ 1.82, ♂ 1.50, width ♀ 1.40, ♂ 1.20. Abdomen length ♀ 3.08, ♂ 1.50, width ♀ 1.96, ♂ 1.00. Leg length (tarsus + metatarsus + tibia + patella + femur = total), ♀, I: $0.84 + 3.08 + 2.80 + 0.70 + 3.08 = 10.5$, II: $0.70 + 2.52 + 2.10 + 0.70 + 2.66 = 8.68$, III: $0.56 + 1.12 + 0.70 + 0.42 + 1.40 = 4.20$, IV: $0.70 + 2.10 + 1.54 + 0.56 + 1.96 = 6.86$; ♂, I: $0.80 + 2.80 + 2.40 + 0.72 + 2.96 = 9.68$, II: $0.64 + 2.16 + 2.00 + 0.40 + 2.40 = 7.60$, III: $0.48 + 0.88 + 0.64 + 0.32 + 1.20 = 3.52$, IV: $0.64 + 1.76 + 1.20 + 0.40 + 1.76 = 5.76$.

Female and male: Carapace length/width ♀ 1.30, ♂ 1.25. Male palp as in Fig. 5. Femora IV with two rows of trichobothria. Abdomen length/width ♀ 1.57, ♂ 1.50; with three pairs of dorsal tubercles, inconspicuous in male. Female epigynum as in Fig. 4.

Coloration and markings in alcohol. Female and male: Carapace yellow, head region darker. Legs brown without annulation. Abdomen speckled with silver and with black markings.

Range. Taiwan (new record), Indonesia, Singapore and The Philippines.

Leucauge tessellata (Thorell 1887)

Figs. 7-9

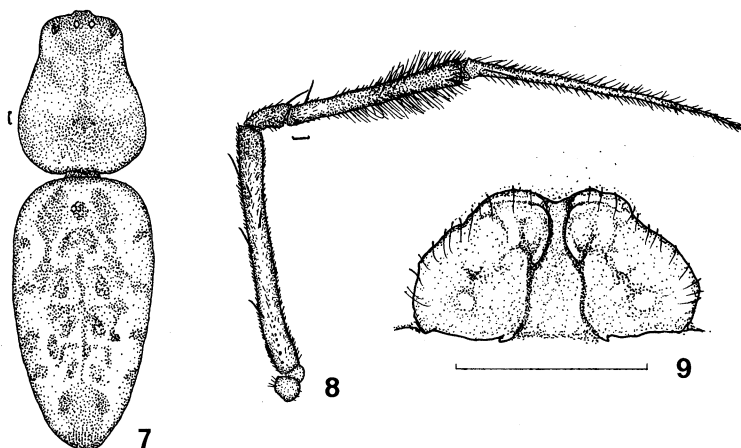
Callinethis tessellata Thorell 1887, p. 135.

Argyropeira tessellata Thorell 1895, p. 155; Thorell 1898, p. 331; Pocock, 1900, p. 216.

Leucauge tessellata Tikader 1982, p. 80.

Specimens examined. 2 ♀, Mt. Nan-Jen, Pingtung County, Taiwan, 2-IV-1998, Y.-T. Liu leg (THU-Ar-980007-980008).

Description. Measurements (in mm, using a female from Pingtung County, Taiwan).



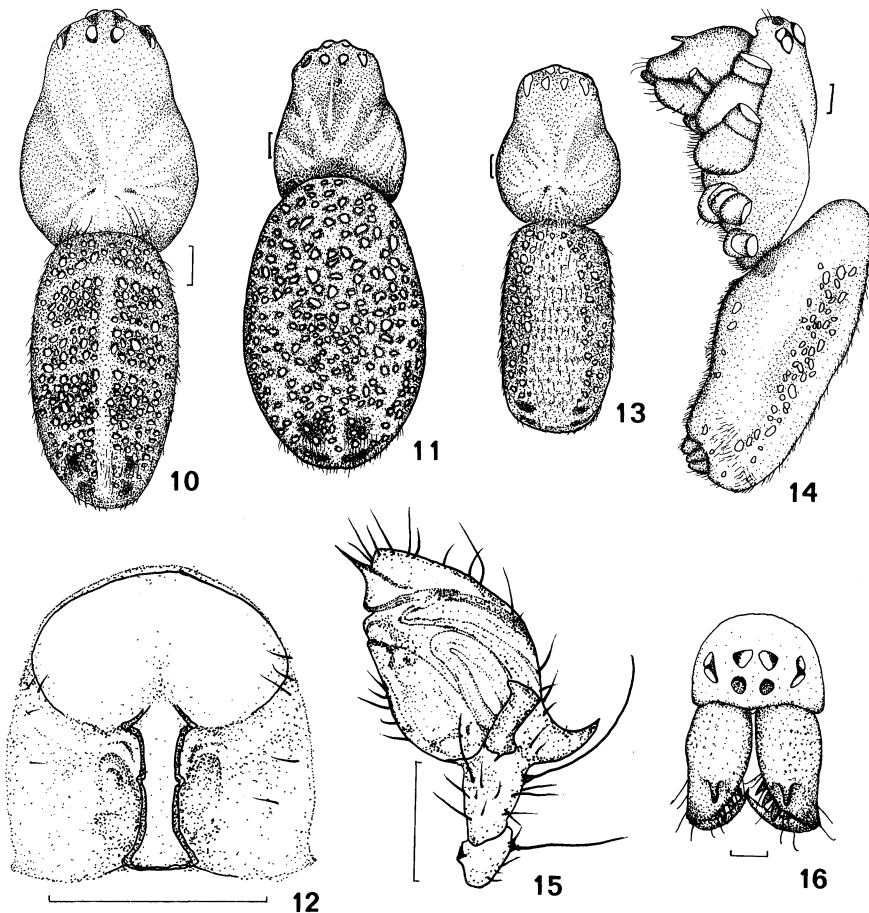
Figs. 7-9. *Leucauge tessellata* (Thorell 1887) — 7, Female carapace and abdomen, dorsal view; 8, female left leg IV, lateral view; 9, epigynum, ventral view. (Scales 0.25 mm.)

Total length ♀ 9.08. Carapace length ♀ 3.50, width ♀ 2.80. Abdomen length ♀ 5.74, width ♀ 2.80. Leg length (tarsus + metatarsus + tibia + patella + femur = total), ♀, I: 1.82 + 7.00 + 5.60 + 1.68 + 6.44 = 22.54, II: 1.40 + 5.32 + 4.34 + 1.40 + 5.46 = 17.92, III: 0.98 + 3.08 + 1.96 + 0.70 + 3.08 = 9.80, IV: 1.12 + 4.48 + 3.06 + 1.12 + 5.04 = 14.82.

Female: Carapace length/width ♀ 1.25. Femora IV with two rows of trichobothria. Abdomen length/width ♀ 2.05. Epigynum as in Fig. 9.

Coloration and markings in alcohol. Female: Carapace yellow. Legs yellowish brown with weak annulation. Tibia IV with many short black hairs (Fig. 8). Abdomen speckled with silver and with black markings.

Range. Taiwan (new record), Burma and India.



Figs. 10-16. *Mesida gemma* Hasselt 1882 — 10, Female carapace and abdomen, dorsal view; 11, same (another female); 12, epigynum, ventral view; 13, male carapace and abdomen, dorsal view; 14, same, lateral view; 15, male palp, lateral view; 16, male carapace and chelicerae, frontal view. (Scales 0.25 mm.)

Mesida gemmea (Hasselt 1882)

Figs. 10-16

Meta gemmea Hasselt 1882, p. 26.*Argyropeira gemmea*: Thorell 1890, p. 206; Thorell 1892, p. 462; Thorell 1895, p. 152; Workman 1896, p. 56.*Mesida gemmea*: Chrysanthus 1975, p. 27.

Specimens examined. 2 ♂, Chung-Ai Bridge, Lanyu, Taitung County, Taiwan, 15-II-1997; (THU-Ar-980009-9800010) 1 ♂, same locality, 17-II-1997 (THU-Ar-980011); 1 ♀, same locality, 12-V-1997 (THU-Ar-980012); 1 ♀, Tien-Chich Camp Ground, Lanyu, Taitung County, Taiwan, 18-II-1997 (THU-Ar-980013); all the specimens were collected by I.-M. Tso.

Description. Measurements (in mm, using a female and a male from Lanyu, Taiwan). Total length ♀ 4.48, ♂ 3.92. Carapace length ♀ 2.24, ♂ 1.68, width ♀ 1.40, ♂ 1.40. Abdomen length ♀ 2.80, ♂ 2.66, width ♀ 1.68, ♂ 1.26. Leg length (tarsus + metatarsus + tibia + patella + femur = total), ♀, I: 1.00 + 3.20 + 3.00 + 0.80 + 2.60 = 10.6, II: 0.80 + 2.30 + 1.70 + 0.60 + 2.10 = 7.50, III: 0.50 + 0.10 + 0.70 + 0.50 + 1.30 = 3.10, IV: 0.70 + 1.60 + 1.60 + 0.50 + 2.00 = 6.40; ♂, I: 1.30 + 4.20 + 3.50 + 0.80 + 4.00 = 13.8, II: 1.00 + 3.20 + 2.70 + 0.70 + 3.00 = 10.6, III: 0.50 + 1.30 + 1.00 + 0.60 + 1.50 = 4.90, IV: 0.70 + 1.00 + 2.00 + 0.50 + 2.60 = 6.80.

Female and Male: Carapace length/width ♀ 1.60, ♂ 1.20. Male chelicera frontally with a spur. Male palp as in Fig. 15. Femora IV with two rows of trichobothria. Abdomen length/width ♀ 1.67, ♂ 2.11. Epigynum as in Fig. 12.

Coloration and markings in alcohol. Female and male: Carapace yellow. Legs yellowish brown without annulation. Abdomen speckled with silver and with black markings.

Range. Taiwan (new record), Burma, Singapore and Indonesia.

Family Araneidae

Eriovixia excelsa (Simon 1889)

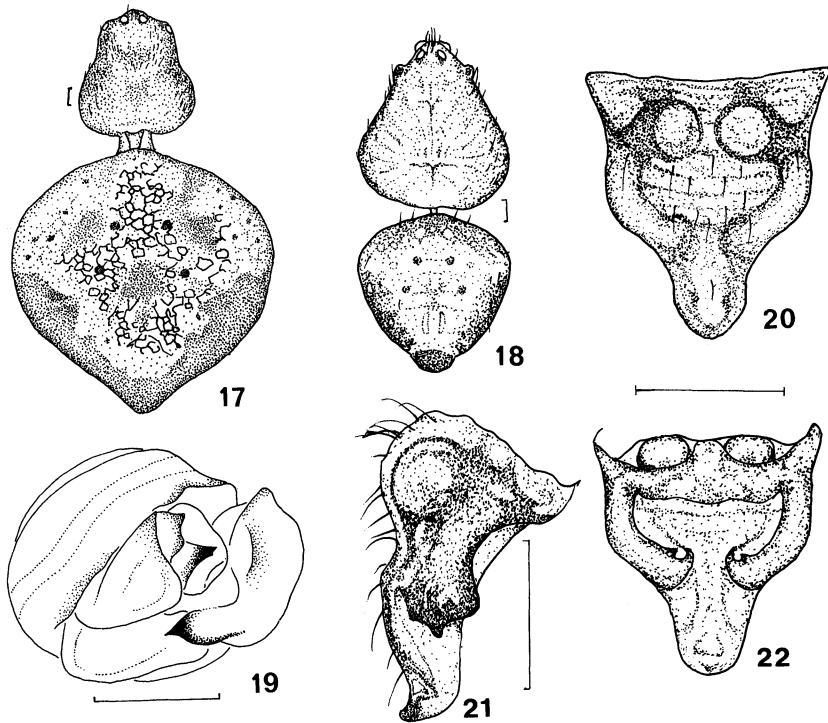
Figs. 17-22

Glyptogona excelsa Simon 1889, p. 337.*Araneus excelsus*: Simon 1895, pp. 820, 867; Simon 1906, p. 283.*Neoscona excelsus*: Tikader 1982, p. 261.*Eriovixia excelsa*: Grasshoff 1986, p. 118; Barrion & Listinger 1995, p. 643.

Specimens examined. 1 ♀, Suburb of I-Lan City, I-Lan County, Taiwan, 4-IV-1998, S.-T. Wu leg. (THU-Ar-980014); 1 ♀, Nanshan-hsi, 800-900 m, Nant'ou County, Taiwan, 16-III-1991, A. Shinohara leg. (NSMT-Ar 4474); 3 ♀ 1 ♂, Chih-Pen, Taitung County, Taiwan, 15-VII-1977, H. Yoshida leg. (NSMT-Ar 4475); 2 ♀ 1 ♂, Paolai-wench'uan, 400 m, Kaohsiung County, Taiwan, 8-III-1991, H. Ono leg. (NSMT-Ar 4476).

Description. Measurements (in mm, using a female and a male from Taiwan). Total length ♀ 5.50, ♂ 3.72. Carapace length ♀ 2.20, ♂ 1.92, width ♀ 1.60, ♂ 1.65. Abdomen length ♀ 3.50, ♂ 1.72, width ♀ 3.60, ♂ 1.70. Leg length (tarsus + metatarsus + tibia + patella + femur = total), ♀, I: 0.50 + 1.00 + 1.20 + 0.80 + 2.00 = 5.50, II: 0.50 + 1.00 + 1.00 + 0.70 + 1.80 = 5.00, III: 0.40 + 0.50 + 0.50 + 0.40 + 1.00 = 2.80, IV: 0.40 + 0.80 + 0.80 + 0.50 + 1.70 = 4.20; ♂, I: 0.50 + 1.17 + 1.33 + 0.69 + 1.98 = 5.67, II: 0.50 + 1.16 + 1.34 + 0.70 + 1.84 = 5.54, III: 0.33 + 0.53 + 0.55 + 0.41 + 1.05 = 2.87, IV: 0.39 + 0.93 + 0.85 + 0.52 + 1.33 = 4.02.

Female and male: Carapace length/width ♀ 1.38, ♂ 1.16. Male palp as in Fig. 19.



Figs. 17–22. *Eriovixia excelsa* (Simon 1889) — 17, Female carapace and abdomen, dorsal view; 18, male carapace and abdomen, dorsal view; 19, male left palp, apical view; 20, epigynum, ventral view; 21, same, lateral view; 22, same, dorsal view. (Scales 0.25 mm.)

Abdomen length/width ♀ 0.97, ♂ 1.01, with a tubercle at posterior end. Epigynum as in Figs. 20–22.

Coloration and markings in alcohol. Female and male: Carapace dark brown, head region lighter. Legs brown with dark brown annulation. Abdomen white mottled with black.

Range. Taiwan (new record), India, Pakistan, Indonesia and The Philippines.

Eriovixia sakiedaorum Tanikawa 1999

Eriovixia sakiedaorum Tanikawa 1999 p. 45.

Specimens examined. 1 ♀, Wu-Lai, Taipei County, Taiwan, 12-X-1889, H. Ono leg. (NSMT-Ar 4477); 1 ♀, Wu-Lai, Taipei County, Taiwan, 30-VII-1977, H. Yoshida leg. (NSMT-Ar 4478); 1 ♂, Kueishan, 120 m, Ilan County, 18-III-1991, H. Ono leg. (NSMT-Ar 4479); 1 ♀, Kuantao-hsi, Nantou County, Taiwan, 19-III-1991, A. Shinohara leg. (NSMT-Ar 4512); 1 ♀, Chung-Ai Bridge, Lanyu, Taitung County, Taiwan, 18-III-1997, I.-M. Tso leg. (THU-Ar-980014); 1 ♀, same locality and collector, 17-V-1997 (THU-Ar-980015); 1 ♀, Yung-Hsing Farm, Lanyu, Taitung County, Taiwan, 14-IV-1997, I.-M. Tso leg. (THU-Ar-980016); 1 ♂, same locality and collector, 16-IV-1997 (THU-Ar-980017); 3 ♀ 1 ♂, Lanyu, Taitung County, Taiwan, 25-VI-1997, Y.-H. Chang leg.; 1 ♀, Nanjenshan, Pingtung County, Taiwan, 22-VI-1996, Y.-H. Chang leg.; 1 ♀, 21-VII-1996, same locality and collector.

Description. See Tanikawa (1999).

Range. Taiwan (new record) and Japan.

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