

## Two new species of the water strider genus *Metrocoris* MAYR, 1865 (Insecta: Heteroptera: Gerridae) from Vietnam, and redescription of *M. femoratus* (PAIVA, 1919) from Meghalaya, India

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### Abstract

Two new species of *Metrocoris* are described from Vietnam: *Metrocoris vietnamensis* sp.n. belongs to the *M. bilobatus* group (sensu CHEN & NIESER 1993) and is closely related with *M. bilobatooides* CHEN & NIESER, 1993 from Vietnam. *Metrocoris quynhi* sp.n. is a species of the *M. anderseni* group (sensu CHEN & NIESER 1993) and resembles *M. genitilis* CHEN & NIESER, 1993 from Thailand. Morphological characteristics of the *M. anderseni* group are discussed. *Metrocoris femoratus* (PAIVA, 1919) is redescribed from newly collected material from the type locality in Meghalaya, northeastern India, and recognized as a species of the *M. anderseni* group.

**Key words:** Gerridae, *Metrocoris*, *Metrocoropsis*, new species, redescription, Vietnam, India

### Zusammenfassung

Zwei Arten der Gattung *Metrocoris* aus Vietnam werden neu beschrieben: *Metrocoris vietnamensis* sp.n. gehört in die *M. bilobatus*-Artengruppe (sensu CHEN & NIESER 1993) und ist hier nächstverwandt mit *M. bilobatooides* CHEN & NIESER, 1993, ebenfalls aus Vietnam. *Metrocoris quynhi* sp.n. ist eine Art der *M. anderseni*-Artengruppe (sensu CHEN & NIESER 1993) und ist *M. genitilis* CHEN & NIESER, 1993 aus Thailand am ähnlichsten. Morphologische Merkmale der *M. anderseni*-Artengruppe werden diskutiert. *Metrocoris femoratus* (PAIVA, 1919) aus Meghalaya, Nordostindien, wird nach neu gesammeltem, teils vom Locus typicus stammendem Material wiederbeschrieben und als zur *M. anderseni*-Artengruppe gehörig erkannt.

### Introduction

*Metrocoris* MAYR, 1865 has a mainly Oriental distribution and reaches the south of the Palearctic Region in the north and west, and Sulawesi in the east. *Metrocoris* is the most diverse genus of the Gerridae in this area; 61 valid species have been described so far and more undescribed taxa are known from India, China, and the Philippines. The highest species diversity is found in southern China and Southeast Asian mainland. The genus was revised in a comprehensive study by CHEN & NIESER (1993), with descriptions of 25 new species, redescription of most previously described species (except *M. femoratus* PAIVA, 1919), an identification key, and a grouping of all species to monophyletic species groups. Their study serves as an excellent base for the future phylogenetic study of the genus. More recently, a few publications on *Metrocoris* appeared, which

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contain descriptions of new species and are mostly based on the revision's species group concept. Only six species of *Metrocoris* have been recorded from Vietnam (CHEN & NIESER 1993, ZETTEL & CHEN 1996), two undescribed species are added in this paper.

### Material and methods

Material studied consists of dry-mounted and alcohol preserved specimens deposited in the following collections:

NHMW Natural History Museum Vienna, Austria

PPCC Coll. Ping-ping Chen, Tiel, The Netherlands

ZMHU Zoological Museum, Hanoi University of Science, Vietnam

ZMUC Zoological Museum, University of Copenhagen, Denmark

ZRC Zoological Reference Collection, National University of Singapore

Insects were examined with a Leica Wild M10 and a Nikon SMZ800 binocular microscope; studies on parameres and endosoma have been made with a Nikon Labophot-2 compound microscope. Drawings were made with the help of a camera lucida fixed to these microscopes. Habitus illustrations were taken with a Nikon D100 Digital-SLR camera.

If no variations are given, measurements refer to the holotype, allotype, or a single, randomly selected specimen of the winged morphs, or all morphs of *M. femoratus*. All measurements are given in millimetres. Because of the length of the specimens is slightly varying due to preparation, body lengths are presented in tenths of a millimetre only.

Terminology mainly follows CHEN & NIESER (1993). Males of *Metrocoris* have small, paired sclerites at the basolateral opening of the pygophore, which are situated between bases of proctiger and paramere (e.g., Figs. 4, 5). CHEN & ZETTEL (1999) have named this structure "dorsal process of pygophore" and have pointed out its significance for species identification. In some species this sclerite is separated from the pygophore by a membrane; it is named "dorsolateral sclerite of pygophore" in this paper.

### Descriptions

#### *Metrocoris vietnamensis* sp.n. (Figs. 1 - 9, 24, 26, 27)

**Type material:** holotype (apterous male) and allotype (apterous female): VIETNAM, Da Nang province, Ba Na – Nui Chua, Suoi Nai – Thac Cau Vong (Nai stream and Rainbow waterfall), 1370 m, 15°59.615'N 107°59.466'E, 26.V.2003, leg. A.D. Tran (TAD 0334); paratypes: 16 ♂♂, 27 ♀♀ (apterous), 1 ♂ (macropterous), same locality data as holotype; 3 ♀♀ (apterous), VIETNAM, Da Nang province, Ba Na – Nui Chua, small stream under De-Bay bridge, 1354 m, 15°59.730'N 107°59.715'E, 26.V.2003, leg. A.D. Tran (TAD 0335) (holotype, allotype and paratypes in ZMHU, Vietnam; further paratypes in ZRC, Singapore and NHMW, Austria).

#### **Description of apterous form:**

Size: Apterous male: Length 6.0 - 6.8 (holotype 6.7), width 2.67 - 3.06 (holotype 2.96). Apterous female: Length 5.1 - 5.5 (allotype 5.4), width 2.81 - 3.10 (allotype 3.01).

Colour (Fig. 24): Dorsal dark markings prominent. Interocular area without dark mark or with light brown mark. Antenna: segment 1 yellowish at basal half, brown to black at distal half, segments 2 - 4 black. Pronotum with black, T-shaped mark at anterior margin and medianly. Mesonotum: sublateral stripes dark, long and slender, lateral stripes and median longitudinal stripe black and straight, slender, running toward anterior margin. Metanotum: black with two broad, hook-shaped yellowish marks; metacetabular stripe black, short, not running throughout its length. Fore femur with apical dark ring and two longitudinal dark marks of which ventral mark connected with ring, and the external mark not confluent, dark brown. Fore tibia dark yellowish at basal fifth, distal part dark brown to blackish; fore tarsus blackish. Middle and hind legs: femora yellowish, tibiae and tarsi dark brown. Abdomen mainly blackish dorsally, tergite 1 with one yellowish mark posteriorly, tergites 2 - 7: anterior halves blackish, posterior halves yellowish. Venter bright yellow.

Structural characters of male: Head width 1.78; interocular width 0.68; head length 1.14; eye length 0.83. Lengths of antennal segments 1 - 4: 2.62 - 1.12 - 0.88 - 0.73. Pronotum width: 1.82. Lengths of leg segments (femur - tibia - tarsus): fore leg: 3.25 - 2.81 - 1.19; middle leg: 7.90 - 5.80 - 2.67; hind leg: 8.10 - 4.51 - 0.67. Width of fore femur: 1.05. Fore femur (Figs. 1, 2, 24) variably incrassate, ratio length / width: 3.03 - 4.36 (holotype 3.10); ventral surface of fore femur at distal quarter with black indentation which proximally marked by distinct tooth, and with single stout subapical tooth; inner surface of fore tibia with tooth-like elevation sub-basally (indistinct in males with small fore leg).

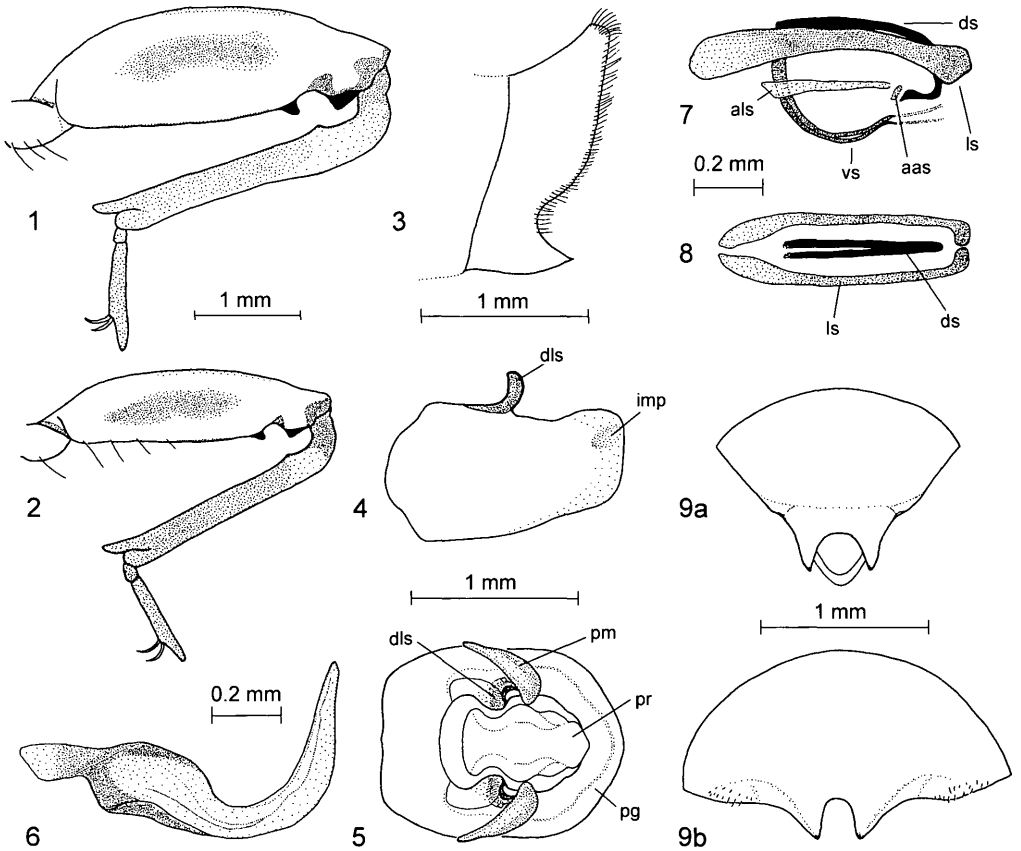
Genitalia of male: Segment 8 (Fig. 3) large, with posterodorsal margin upcurved and postero-ventral margin bearing short, but wide lobe, length 1.20, width 1.27. Pygophore (Figs. 4, 5) not raised posteriorly, caudal margin broadly rounded, caudal face with paired, shallow impressions, dorsolateral sclerite curved and apically blunt. Proctiger (Fig. 5) elongate. Paramere (Fig. 6) prominent, falciform, strongly curved and apically strongly narrowed. Endosoma (Figs. 7, 8): dorsal sclerite long and recurved proximally, apical accessory sclerite distinct, lateral sclerite very large, slightly curved, ventral sclerite short, thin accessory lateral sclerite present.

Structural characters of female: Head width 1.66; interocular width 0.61; head length 0.83; eye length 0.76. Lengths of antennal segments 1 - 4: 2.02 - 0.88 - 0.90 - 0.76. Pronotum width: 1.76. Lengths of leg segments: fore leg: 2.67 - 2.39 - 0.98; middle leg: 7.10 - 4.85 - 2.76; hind leg: 7.00 - 4.37 - 0.71. Width of fore femur: 0.38. Fore femur slender, without teeth, ratio length / width: 6.55 - 6.89.

Genitalia of female: Sternum 7 (Figs. 9a, b) large, slightly longer than preceding abdominal segments together. Posterior third constricted, bifid forming two widely separated lobes, slightly slanting but not curved upwards. Notch between lobes as wide as each lobe. Apices of lobes pointed, reaching apex of abdomen in ventral view.

#### **Description of macropterous male:**

Colour: Pronotum at anterior margin black, with one medial dark brown stripe and two light brown sublateral stripes, sublateral stripes not confluent with median stripe; lateral margin between anterior corner and humeri totally black; posterior margin between humeri and apex bright yellow. Fore wings mainly dark brown, anterior margin densely set with black hairs, and posterior margin with narrow yellowish band.



Figs. 1 - 9: *Metrocoris vietnamensis* sp.n. (1 - 8: male, 9: female): (1, 2) fore legs; (3) abdominal segment 8, in situ, lateral view; (4) pygophore, lateral view; (5) genital capsule, dorsal view; (6) left paramere; (7) male endosoma structure, lateral view, (8) same, dorsal view; (9) female sternum 7 (a: in situ; b: after dissection); aas – accessory apical sclerite; als – accessory lateral sclerite; dls – dorsolateral sclerite of pygophore; ds – dorsal sclerite; imp – impression; ls – lateral sclerite; pg – pygophore; pm – paramere; pr – proctiger; vs – ventral sclerite.

Structure: Length 6.2, width 2.73. Head width 1.63, head length 0.97, interocular width 0.59, eye length 0.75. Lengths of antennal segments 1 - 4: 2.36 – 0.95 – 0.83 – 0.68. Pronotum: apex pointed, median length 3.15, humeral width 2.47. Fore wing length 6.0. Lengths of leg segments: fore leg: 2.72 – 2.38 – 1.03; middle leg: 7.20 – 5.10 – 2.67; hind leg: 7.30 – 4.17 – 0.69. Fore femur less incrassate than in apterous male, ratio length / with: 4.46.

Macropterous female unknown.

**Comparative notes:** *Metrocoris vietnamensis* sp.n. is a species of the *M. bilobatus* group as defined by CHEN & NIESER (1993) and closely related with *M. bilobatooides* CHEN & NIESER, 1993 from northern Vietnam. This species group is characterized by the following features: strongly incrassate fore femur of the male with broad indentation ventrally in distal third or fourth, and subapically with stout, usually shallowly bifid tooth (Figs. 1, 2); large genital segments with prominent parameres (Figs. 3 - 6); very long sternum 7

of the female (Fig. 9) apically produced into two distinct lobes (CHEN & NIESER 1993); and segment 8 of the male (Fig. 3) with postero-dorsal margin upcurved and postero-ventral margin bearing a short, but wide lobe. Using the key of CHEN & NIESER (1993), the male of *M. vietnamensis* sp.n. keys out to *M. bilobatoides*, because of the presence of a tooth proximal to the ventral indentation of the fore femur (Figs. 1, 2); the female of *M. vietnamensis* sp.n., however, keys out to *M. bilobatus* DEN BOER, 1965 from Yunnan, China, because of the relatively light colour pattern and similar structures of sternum 7 (Fig. 9). The male of *M. vietnamensis* sp.n. differs from *M. bilobatus*, *M. bilobatoides*, and *M. strictus* CHEN & NIESER, 1993 (a species from northern Thailand) distinctly in the shape of the paramere (Fig. 6), and from *M. bilobatus* and *M. bilobatoides* in having lighter colour pattern. The fifth species of the *M. bilobatus* group, *M. shepardi* CHEN & ZETTEL, 1999, is only known from the female and can be easily distinguished by the paired lateral processes of abdominal tergite 7 (CHEN & ZETTEL 1999).

**Distribution:** Known only from type locality in Da Nang province, Vietnam.

**Etymology:** This species is named after the country of origin, Vietnam.

**Habitats** (Figs. 26, 27): *Metrocoris vietnamensis* sp.n. has been found in a very small stream near the top of a high mountain (above 1300 m) in central Vietnam. The stream is under shade, with moderate or slow current, with sandy and rocky bottom.

### *Metrocoris qynhi* sp.n. (Figs. 10 - 17, 25, 28, 29)

**Type material:** holotype (apterous male) and allotype (apterous female): VIETNAM, Lao Cai province, Sa Pa, Hoang Lien National Park, upstream of Thac Bac waterfall, 2001 m, 22°21.823'N 103°46.757'E, 3.VI.2003, leg. A.D. Tran (TAD 0342); paratypes: 2 ♂♂, 3 ♀♀ (apterous), 5 ♂♂, 4 ♀♀ (macropterous), same locality data as holotype; 1 ♀ (apterous), 1 ♂ (macropterous), VIETNAM, Lao Cai province, Sa Pa, Sin Chai, 1366 m, 22°20.421'N 103°48.844'E, 1.VI.2003, leg. A.D. Tran (TAD 0337); 1 ♂ (macropterous), VIETNAM, Lao Cai province, Sa Pa, Nui Xe, small water flow, 1978 m, 22°21.110'N 103°46.216'E, 2.VI.2003, leg. A.D. Tran (TAD 0338); 1 ♂, 1 ♀ (apterous), 1 ♂, 3 ♀♀ (macropterous), VIETNAM, Lao Cai province, Sa Pa, Nui Xe Forest Ranger Station, small stream, 1928 m, 22°21.163'N 103°46.695'E, 2.VI.2003, leg. A.D. Tran (TAD 0339); 1 ♀ (apterous), 1 ♂ (macropterous), VIETNAM, Lao Cai province, Sa Pa, Nui Xe, Suoi Vang stream, 1864 m, 22°20.835'N 103°46.446'E, 3.VI.2003, leg. A.D. Tran (TAD 0345a); 5 ♂♂, 3 ♀♀ (apterous), 4 ♂♂, 5 ♀♀ (macropterous), VIETNAM, Lao Cai province, Sa Pa, Nui Xe, small tributary to Suoi Vang stream, 1871 m, 22°20.965'N 103°46.523'E, 3.VI.2003, leg. A.D. Tran (TAD 0345b) (holotype, allotype, and paratypes in ZMHU, Vietnam; further paratypes in ZRC, Singapore and NHMW, Austria).

### **Description of apterous form:**

Size: Apterous male: Length 6.3 - 7.0 (holotype 6.6), width 3.03 - 3.25 (holotype 3.10). Apterous female: Length 5.4 - 5.8 (allotype 5.45), width 3.30 - 3.40 (allotype 3.40).

Colour (Fig. 25): Dorsal dark markings distinct and prominent. Interocular area with broad dark mark medially. Antenna: segment 1 totally or basally yellow, segments 2 - 4 black. Pronotum with black T-shaped mark at middle of anterior margin and medianly, and with two broad black marks close to anterolateral margin. Mesonotum: sublateral stripes broader than lateral stripes, nearly equal in width to transverse bands; stripes on mesacetabula thin, running toward anterior marginal mark; medial stripe on mesopleura black, thin and straight. Metanotum: black mark broad at anterior margin, but thin at posterior margin. Fore leg: fore femur with apical dark ring and four longitudinal marks, ventral mark connected with ring, remaining marks not confluent, dorsal and inner mark

pale and brighter, external mark broad and dark brown; fore tibia and tarsus black. Middle and hind legs: femora yellowish, tibiae and tarsi dark brown. Abdomen mainly black dorsally, covered with golden pubescence. Venter bright yellow.

Structural characters of male: Head width 1.83; interocular width 0.68; head length 1.02; eye length 0.85. Lengths of antennal segments 1 - 4: 3.15 - 1.17 - 0.92 - 0.87. Pronotum width: 1.97. Lengths of leg segments (femur - tibia - tarsus): fore leg: 3.69 - 3.01 - 1.35; middle leg: 8.10 - 6.10 - 3.29; hind leg: 8.00 - 5.80 - 0.94. Width of fore femur: 1.02. Fore femur (Fig. 10) incrassate, ratio length / width: 3.22 - 3.67 (holotype 3.62), constricted in apical third, but without distinct ventral indentation, with bipartite apical tooth, of which the distal part is the elevated rim of the ventral surface. Inner face of tibia with sub-basal tooth-like elevation.

Genitalia of male: Segment 8 (Fig. 11) large, rectangular on dorsal view, length 1.43, width 1.03 - 1.16 (holotype 1.06). Pygophore (Figs. 12, 13), on dorsal view, prolonged and subapically constricted, with straight apical margin, and with straight, slender dorsolateral sclerite. Proctiger (Fig. 13) long, with narrow distal part. Paramere (Fig. 14) hook-shaped, apically pointed. Endosoma (Fig. 15, 16): dorsal sclerite long and recurved proximally, apical accessory sclerite indistinct, lateral sclerite straight, ventral sclerite long.

Structural characters of female: Head width 1.78; interocular width 0.67; head length 0.98; eye length 0.79. Lengths of antennal segments 1 - 4: 2.43 - 0.98 - 0.92 - 0.79. Pronotum width: 1.95. Lengths of leg segments: fore leg: 2.91 - 2.47 - 1.06; middle leg: 8.20 - 5.20 - 3.10; hind leg: 6.85 - 5.10 - 0.81. Width of fore femur: 1.10. Fore femur slender, ratio length / width: 6.61, with long stout hairs at basal half, length of those hairs shorter than or equal to femoral width.

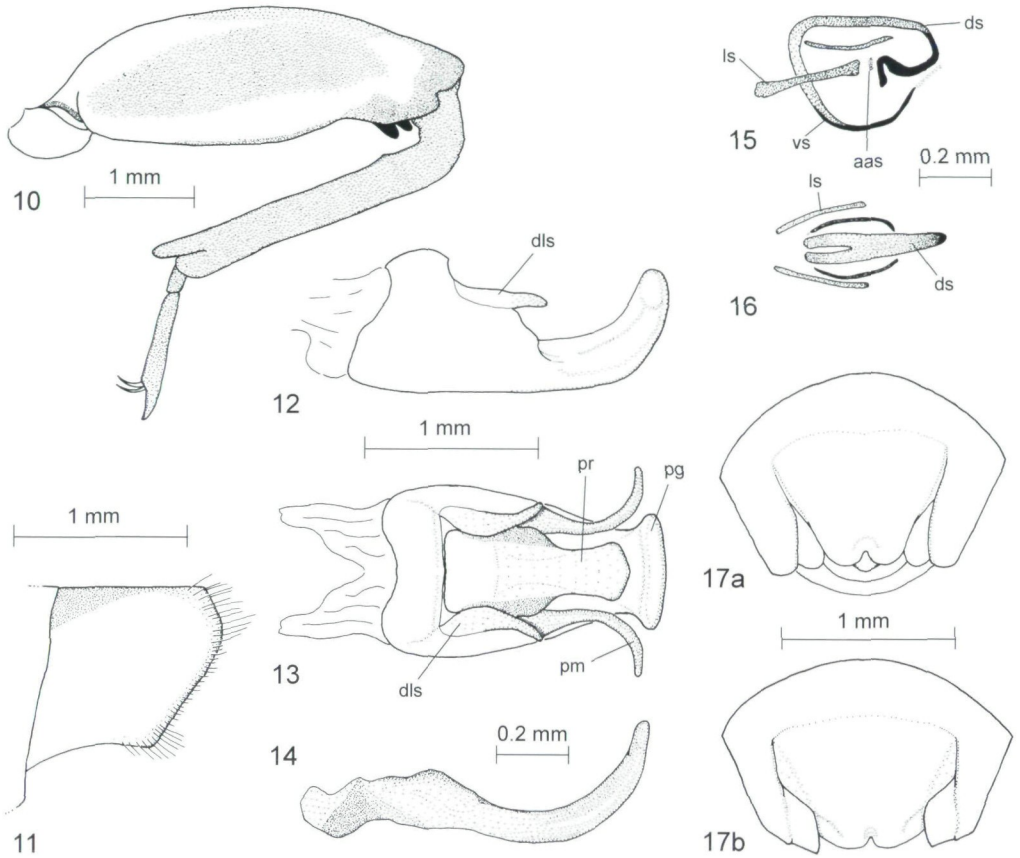
Genitalia of female: Sternum 7 (Figs. 17a, b) with large medial lobe; lateral parts with longitudinal ridge from anterior end of incision to hind margin, and with small, mediad directed, wing-shaped lobes covering mostlateral parts of medial lobe; medial lobe subtrapezoidal, with distinctly notched hind margin, slanted dorsocaudad. On dorsal view, tergite 7 small and hidden under tergite 6.

### **Description of macropterous form:**

Size: Macropterous male: Length 6.4 - 6.5, width 3.00 - 3.30. Macropterous female: length 5.0 - 5.5, width 3.01 - 3.30.

Colour: Pronotum: anterior and anterolateral margins in front of humeri black; paired dark sublateral stripes narrower than transverse bands, confluent with median stripe anteriorly; posterior margin from humeri to apex yellowish. Wings mainly brown, anterior margin with densely set black hairs and posterior margin with narrow yellowish band. Colour of antenna and legs similar to apterous form.

Structural characters of male: Head width 1.80; interocular width 0.69; head length 1.00; eye length 0.79. Lengths of antennal segments 1 - 4: 2.86 - 1.05 - 0.83 - 0.86. Pronotum: apex pointed, median length 3.78, humeral width 2.81. Lengths of leg segments: fore leg: 3.15 - 2.62 - 1.19; middle leg: 7.50 - 5.70 - 3.06; hind leg: 7.40 - 5.30 - 0.74. Width of fore femur: 0.73 - 0.76. Fore femur moderately incrassate, ratio length / width: 3.83 - 4.32. Wings surpassing apex of abdomen, length of fore wing 6.7. Other characters similar to apterous males.



Figs. 10 - 17: *Metrocoris quynhi* sp.n. (10 - 16: male, 17: female): (10) fore leg; (11) abdominal segment 8, in situ, lateral view; (12) pygophore, lateral view; (13) genital capsule, dorsal view; (14) left paramere; (15) endosoma structure, lateral view; (16) same, dorsal view; (17) female sternum 7 (a: in situ; b: after dissection); aas – accessory apical sclerite; dls – dorsolateral sclerite of pygophore; ds – dorsal sclerite; ls – lateral sclerite; pg – pygophore; pm – paramere; pr – proctiger; vs – ventral sclerite.

Structural characters of female: Head width 1.71; interocular width 0.67; head length 0.84; eye length 0.75. Lengths of antennal segments 1 - 4: 2.07 – 0.835 – 0.84 – 0.79. Pro-notum: apex pointed, median length 3.54, humeral width: 2.67. Lengths of leg segments: fore leg: 2.52 – 2.23 – 0.98; middle leg: 6.80 – 4.85 – 2.91; hind leg: 6.50 – 4.90 – 0.79. Width of fore femur: 0.35. Fore femur slender, ratio length / width: 7.2. Wings surpassing apex of abdomen, length of fore wing 6.2. Other characters similar to apterous female.

**Comparative notes:** *Metrocoris quynhi* sp.n. belongs to the *M. anderseni* group. This group is characterized by the following features: fore femur of male (Fig. 10) strongly incrassate, constricted in apical part, and with bipartite (sub-)apical tooth (the distal part being the strongly raised rim of the ventral surface); inner face of fore tibia of male (Fig. 10) with sharp, tooth-like elevation sub-basally; genital segments of male very large, with prolonged and subapically constricted pygophore (Figs. 12, 13); sternum 7

of female (Fig. 17) very long, medially produced to broad lobe (CHEN & NIESER 1993); segment 8 of male (Fig. 11) cylindrical, with distinct lateral incision at posterior margin; dorsolateral sclerite of pygophore (Figs. 15, 16) elongate, sclerotized and connected with main piece by flexible membrane; parameres (Fig. 14) curved laterad; proctiger of male (Fig. 13) slender, elongate, and with subapical constriction; sternum 7 of female (Fig. 17) complex, with medial lobe apically truncate and with median notch, and with lateral areas each bearing a longitudinal ridge separating a dorsad curved lateral part from a lobe-like, mediad directed medial part.

This group contains *M. anderseni* CHEN & NIESER, 1993 and *M. falcatus* CHEN & NIESER, 1993, both from Uttar Pradesh, India; *M. femoratus* (PAIVA, 1919) from Meghalaya, India (see below); and *M. genitilis* CHEN & NIESER, 1993 from Yunnan, China, and Chiang Mai, Thailand. *Metrocoris quynhi* sp.n. is the first record of *M. anderseni* group in Vietnam. Using the key of CHEN & NIESER (1993), the male of *M. quynhi* sp.n. keys out to *M. falcatus*, but differs from this species in having considerably longer parameres; the female keys out to *M. anderseni*, because females of *M. falcatus*, *M. genitilis*, and *M. femoratus* were not included in the key. The male of *M. quynhi* sp.n. differs from all species of the group in its hook-shaped paramere (Fig. 14). It is smaller in size than *M. anderseni* and *M. genitilis* in smaller size, and differs from *M. femoratus* in the absence of a ventral tooth on the fore femur (comp. Figs. 10 and 18). Based on the genital structures of the male, *M. quynhi* sp.n. seems to be most closely related with *M. genitilis*.

**Distribution:** Lao Cai province, Vietnam.

**Etymology:** This species is dedicated to Dr. Nguyen Xuan Quynh, Hanoi University of Science, Vietnam, for his enthusiastic support and encouragement to the first author to study aquatic Heteroptera of Vietnam. "*Quynhi*" is pronounced "queen-ee".

**Habitats:** Material of *M. quynhi* sp.n. was collected from different localities with elevation ranging from 1300 to 2000 m in a mountainous area in the northwest of Vietnam. This species inhabits moderate or slow flowing streams with gravel and small stones. Individuals of the species were found to be more crowded in shaded and slow flowing sections of the streams.

### *Metrocoris femoratus* (PAIVA, 1919) (Figs. 18 - 23)

*Metrocoropsis femorata* PAIVA, 1919: 365, pl. 34, fig. 5.

*Metrocoris femorata* (PAIVA): ESAKI 1926: 130.

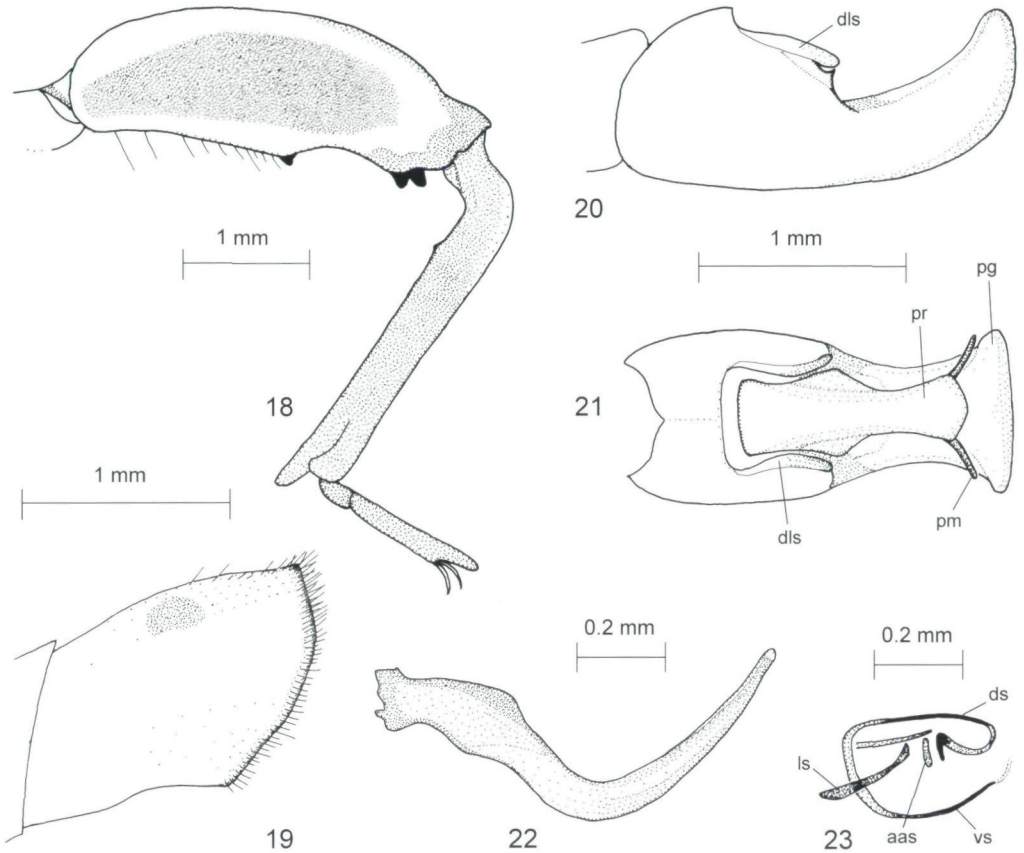
*Metrocoris femoratus* (PAIVA): LUNDBLAD 1933: 317, 373. – DEN BOER 1965: 16, map, fig. 26.  
– CHEN & NIESER 1993: 18.

**Material examined:** 1 ♂, 1 ♀ (apterous), 4 ♂♂, 1 ♀ (macropterous), INDIA, Meghalaya, 3 km E Tura, 1150 m, 25°30'N 90°14'E, 18.IV.1999, leg. L. Dembicky & P. Pacholatko; 3 ♂♂, 4 ♀♀ (apterous), 1 ♂, 6 ♀♀ (macropterous), INDIA, Meghalaya, 1400 m, Nokrok National Park, 3 km S Dorbokgiri, 25°27'N 90°19'E, 26.V.1999, leg. L. Dembicky & P. Pacholatko; 7 ♂♂, 5 ♀♀ (apterous), 3 ♂♂, 4 ♀♀ (macropterous), INDIA, Meghalaya, 9 km NW Jowai, 1400 m, 25°30'N 92°10'E, 12.V.1999, leg. L. Dembicky & P. Pacholatko (specimens in Natural History Museum Vienna; Raffles Museum of Biodiversity Research, Singapore; Coll. Ping-ping Chen, Beijing; Zoological Museum Copenhagen).

### **Description of apterous form:**

**Size:** Apterous male: Length 7.71 - 8.32 (8.30), width 2.96 - 3.39 (3.27). Apterous female: Length 5.30 - 6.05 (5.30), width 3.23 - 3.49 (3.15).





Figs. 18 - 23: *Metrocoris femoratus*, male: (18) fore leg; (19) abdominal segment 8, lateral view; (20) pygophore, lateral view; (21) genital capsule, dorsal view; (22) left paramere; (23) endosoma structure, lateral view; aas – accessory apical sclerite; dls – dorsolateral sclerite of pygophore; ds – dorsal sclerite; ls – lateral sclerite; pg – pygophore; pm – paramere; pr – proctiger; vs – ventral sclerite.

Colour: Dorsal dark markings prominent and distinct. Interocular area with broad dark mark medially. Antenna: segment 1 yellowish at basal half, brown to black at distal half, segments 2 - 4 black. Pronotum: anterolateral markings and median stripe very broad. Mesonotum: sublateral stripes broad, nearly equal in width to transverse bands and connected with anterior black mark, lateral marks broad and connected with anterior mark. Metanotum: black with two broad, hook-shaped yellowish marks; metacetabular stripe black and wide, running throughout length of segment. Fore legs: femur with apical dark ring and four broad longitudinal stripes, ventral mark connected with apical ring, remaining three marks not confluent, external stripe broadest; tibia and tarsus black. Middle and hind legs: femora yellowish, tibiae and tarsi dark brown. Abdomen mainly black dorsally and covered with golden pubescence. Venter bright yellow.

Structural characters of male: Head width 1.95; interocular width 0.75; head length 1.10; eye length 0.75. Lengths of antennal segments 1 - 4: 3.10 – 1.06 – 0.75 – 0.83. In

both apterous and macropterous forms antennal segment 1 stouter than that of female. Pronotum width: 2.00. Lengths of leg segments (femur – tibia – tarsus): fore leg: 3.44 – 2.91 – 1.34; middle leg: 8.40 – 6.40 – 3.10; hind leg: 8.00 – 5.50 – 0.79. Width of fore femur: 1.10. Fore femur (Fig. 18) incrassate, ratio length / width: 3.13 - 3.51 (3.13), apical third constricted, ventrally with indentation in distal third, and proximally delimited by distinct tooth; bipartite subapical tooth distinct, ventral surface with row of stout hairs at basal half. Fore tibia with sub-basal tooth-like elevation.

Genitalia of male: Segment 8 (Fig. 19) large, length 1.48, width 1.27. Pygophore (Figs. 20, 21) elongate, distally upcurved, subapically constricted, with straight apical margin and nearly straight, evenly narrowed, basally indistinctly separated laterodorsal sclerite. Proctiger (Fig. 21) long and narrow. Paramere (Fig. 22) falciform, evenly narrowed towards apex, distal half slender and almost straight. Endosoma (Fig. 23): dorsal sclerite long and recurved proximally, apical accessory distinct, lateral sclerite slightly curved, ventral sclerite long.

Structural characters of female: head width 1.66; interocular width 0.60; head length 0.76; eye length 0.76. Lengths of antennal segments 1 - 4: 2.00 – 0.87 – 0.71 – 0.71. Pronotum width: 1.63. Lengths of leg segments: fore leg: 2.44 – 2.27 – 1.06; middle leg: 6.50 – 4.61 – 2.52; hind leg: 6.30 – 3.93 – 0.67. Width of fore femur: 0.38. Fore femur slender, ratio length / width: 6.26 - 7.08 (6.42), ventrally with scattered, small black spines, basally with stout hairs. Middle and hind femora similar to apterous male.

Genitalia of female: external structures extremely similar to *M. quynhi* sp.n., except medial incision on hind margin of medial lobe of sternum 7 very narrow, distinctly deeper than wide.

### **Description of macropterous form:**

Size: Macropterous male: Length 7.18 - 8.13 (7.40), width 2.97 - 3.28 (3.06). Macropterous female: Length 5.40 - 5.89 (5.40), width 3.11 - 3.30 (3.30).

Colour: Pronotum with thin anterolateral dark mark running from humeri to anterior mark, median stripe broad and running to anterior margin, sublateral stripes confluent with median stripe anteriorly, posterior margin bright yellowish. Wings mainly brownish, anterior margin densely set with hairs and posterior margin with yellowish band.

Structural characters of male: Head width 1.78; interocular width 0.68; head length 1.17; eye length 0.83. Lengths of antennal segments 1 - 4: 2.81 – 1.08 – 0.76 – 0.75. Pronotum with pointed apex, median length 2.74, humeral width: 2.74. Lengths of leg segments: fore leg: 3.35 – 2.76 – 1.17; middle leg: 8.30 – 6.50 – 3.10; hind leg: 8.00 – 5.65 – 0.89. Width of fore femur: 0.80. Fore femur similar to that of apterous male, ratio length / width: 3.42 - 4.19 (4.19). Wings surpassing apex of abdomen, length of fore wing 6.6. Other characters similar to apterous males.

Structural characters of female: Head width 1.76; interocular width 0.63; head length 1.12; eye length 0.79. Lengths of antennal segments 1 - 4: 2.19 – 0.95 – 0.84 – 0.78. Pronotum with pointed apex, median length 2.71, humeral width: 2.71. Lengths of leg segments: fore leg: 2.62 – 2.32 – 1.02; middle leg: 7.10 – 5.50 – 2.81; hind leg: 6.90 – 5.10 – 0.81. Width of fore femur 0.38. Fore femur similar to that of apterous female, ratio length / width: 6.66 - 7.36 (6.89). Wings surpassing apex of abdomen, length of fore wing 6.3. Other characters similar to apterous females.



Figs. 24 - 25: Apterous males of (24) *M. vietnamensis* sp.n. and (25) *M. quynhi* sp.n.

**Notes:** This is the only species of *Metrocoris* not redescribed by CHEN & NIESER (1993), because neither the type material nor other specimens were available to them. Based on the structures of the fore femur (as illustrated by PAIVA 1919), CHEN & NIESER (1993) supposed that *M. femoratus* might be a species of the *M. strangulator* group. Some of



Figs. 26 - 27: Type locality (TAD 0334) of *M. vietnamensis* sp.n.



Figs. 28 - 29: (28) Type locality (TAD 0342) of *M. quynhi* sp.n.; (29) another locality (TAD 0345b) of *M. quynhi* sp.n.

the material examined in this study were from the type locality (PAIVA 1919: "above Tura, 3800 ft.") and fits the description and illustration given by PAIVA (1919) perfectly. Structures of the male genitalia and of the female sternum 7 clearly indicate that *M. femoratus* is a species of the *M. anderseni* species group, which clearly differs from the other species in the presence of a ventral tooth on the fore femur of the male. The female of *M. femoratus* is extremely similar to that of *M. quynhi* sp.n.

As a result of the new position of *M. femoratus*, the *M. strangulator* group is restricted to southeastern Asia, Sumatra, and Java, and the *M. anderseni* group is scattered over various mountainous areas from Uttar Pradesh to Vietnam.

Taxonomically *M. femoratus* is the type species of *Metrocoropsis* PAIVA, 1919 (monobasic). This name is presently in synonymy with *Metrocoris* (CHEN & NIESER 1993), but could be used for a subgenus containing the well defined *M. anderseni* species group (for characteristics see Comparative notes of *M. quynhi* sp.n.). However, assignment of species groups to subgeneric entities must await a complete phylogenetic study of *Metrocoris*.

**Distribution:** North-eastern India: Meghalaya.

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