THE RAFFLES BULLETIN OF ZOOLOGY 1998 **46**(2): 335-344
© National University of Singapore

NOTES ON THE VELIIDAE (HETEROPTERA) OF BORNEO: 1. THREE NEW SPECIES OF *ANGILIA* STÅL, 1865, WITH A KEY TO THE ORIENTAL SPECIES

Herbert Zettel and **Christine Hecher**
Natural History Museum Vienna, 2. Zoologische Abteilung (Entomology), Burgring 7, A-1014 Vienna, Austria.

ABSTRACT. - *Angilia mazzoldii*, new species, *A. anderseni*, new species, and *A. borneensis*, new species, are described from Borneo (Indonesia: Kalimantan). New collecting data of *A. orientalis* Andersen (from Thailand and the Philippines) and *A. bispinosa* Andersen (from Thailand) are presented. The seven Oriental *Angilia* species are arranged in two monophyletic species groups, the *A. orientalis* group and the *A. bispinosa* group. An identification key to the Oriental species is presented.

KEYWORDS. - Veliidae, *Angilia*, new species, new records, Indonesia, Kalimantan, Borneo, Thailand, Philippines.

INTRODUCTION

This is the first contribution of a planned series of papers dealing with the high, but rather poorly known species diversity of Bornean Veliidae. Five subfamilies of Veliidae are known from Borneo: Microveliinae, Haloveliinae, Rhagoveliinae, Perittopinae, and Veliinae. They contain thirteen genera, two of them are undescribed.

Microveliinae is represented by three described genera (*Pseudovelia* Hoberlandt, 1950, *Xiphovelia* Lundblad, 1933, and the heterogenous collective genus *Microvelia* Westwood, 1834) with numerous species; one new genus is unpublished. Haloveliinae is represented by two limnic genera (*Strongylovelia* Esaki, 1924, and *Entomovelia* Esaki, 1930) and three marine genera (*Halovelia* Bergroth, 1893, *Haloveloides* Andersen, 1992, and *Xenobates* Esaki, 1927). Perittopinae contains only the single genus *Perittopus* Fieber, 1861; records of an undescribed species from northern Borneo will be published in a forthcoming paper (Zettel & Hecher, in prep.). Rhagoveliinae is represented by the genus *Rhagovelia* Mayr, 1865, only, which is probably the veliid genus with the most species in Borneo. Most of the described genera (except *Perittopus*) and one undescribed marine genus, which are known from Borneo, have been listed by Polhemus & Polhemus (1990).

Received 10 Oct 1997 Accepted 21 Jan 1998

Veliinae is another poorly represented subfamily in Borneo: Two species of the genus *Tetraripis* Lundblad, 1936 (*T. borneensis* Zettel, 1995, and *T. kodadai* Zettel, 1995) have been described from Sarawak (Zettel, 1995) (the position of *Tetraripis* within the Veliinae is now confirmed by Polhemus 1997), and first species-records of *Angilia* Stål, 1865, are presented in this paper. The presence of *Angilia* in Borneo was reported by Polhemus & Polhemus (1990) for the first time.

Species of the genus *Angilia* are rather large, beautifully coloured Veliidae, which are rarely represented in collections. Most species occur in Africa and Madagascar, but four species were so far reported from South-east Asia, from Thailand, Hong Kong, ? Malaysia, and the Philippines (Andersen, 1981). According to personal observations of the senior author in North Thailand and Busuanga, *A. orientalis* lives hidden at the extreme edge of small, slowly flowing streams, where a rocky shoreline forms narrow, shaded bays. Andersen (1981) describes the type locality of *A. bispinosa*, which is a small, shaded, river-associated pool. All specimens examined are macropterous.

Abbreviation: JTPC - Colorado Entomological Museum [Coll. J.T. Polhemus], Englewood, Colorado, U.S.A.; NMW - Natural History Museum Vienna, Austria; UPLB - Museum of Natural History, University of the Philippines, Los Baños; ZCW - Coll. Zettel, Vienna.

TAXONOMY

Angilia Stål, 1865

Angilia Stål, 1865, Hemiptera Africana 3: 167.

Type species (monobasic): *Velia albidotincta* Stål, 1855 ("Caffraria" [South Africa]).

The genus *Angilia* contains two subgenera: *Angilia* s.str. with several species from Africa and Madagascar, and *Adriennella* Poisson, 1942, with three species from Central Africa and four species from the Oriental Realm (Andersen, 1981).

A diagnosis of the genus has been presented by Andersen (1981).

Angilia species may be confused with other similarly coloured Oriental genera of the subfamily Veliinae, but differ in the finger-like process on the hind margin of the pronotum in the macropterous morph. Further, *Angilovelia* Andersen, 1981 (one species from northern India, Burma [Myanmar], and Peninsular Malaysia), and *Chenevelia* Zettel, 1996 (one species from North Thailand) have stridulatory devices on the connexiva 2 - 3 and on the base of metafemur. *Tetraripis* Lundblad, 1936 (five species from Sri Lanka, South India, Thailand, Peninsular Malaysia, and Borneo) and *Chenevelia* have cleft third tarsomeres on the meso- and metatarsi.

Angilia (*Adriennella*) *mazzoldii*, new species
(Figs. 1, 5, 9, 11, 17, 19)

Material examined. - Holotype (male): INDONESIA: E-Kalimantan, W Samarinda, SW Melak, nr. Sembuan, leg. Mazzoldi (NMW), 11 Jul.1995.

Description of male. - Size. - Length 4.75 mm, maximum width (across pronotal humeri) 1.78 mm.

Colour. - Head brown, median impressed line shiny; antenna with apex of segments 1 and 2 and entire segments 3 and 4 brown, remaining parts light brown to yellow. Pronotal lobe with anterior and posterior parts brown, broad band between and in front of humeri light brown to yellow. Legs with brown and yellow bands. Forewing brown, outer basal cell with longitudinal white patch, discal cell with small white patch, distribution of white patches in apical part of wing as in figure 5. Connexivum light brown to orange-brown, tergites covered by wings. Pleurae and sternites dark brown, stripe on lateral margins of sternites light brown to orange-brown.

Pilosity. - Clypeus, vertex, antenna, pronotal lobe (Fig. 1), legs, metapleura, connexivum, distal process of last connexival segment, and sternites with long, erect, bristle-like hairs and shorter, dense, suberect pubescence. Forewing with short, decumbent hairs except on apical area, subcosta, radius, media, cubitus, and crossvein with long, erect hairs.

Structural characters. - Length of head 0.83 mm, width across eyes 1.05 mm, interocular width 0.45 mm. Antenna 0.77 times as long as body (length of antenna 3.68 mm), relative length of segments 1 - 4 as 0.68 : 0.74 : 1.00 : 0.70; segment 1 of antenna slightly curved, remaining segments straight. Pronotum 0.9 times as wide as long (length 2.05 mm); pronotal lobe strongly raised between humeri, medially with cone-shaped, stout, blunt elevation, humeral angles also forming stout, truncated cones; hind margin of pronotum drawn out into a finger-like, straight projection, not curved in lateral view (Figs. 1, 11); pronotum (except on elevations and finger-like projection) and pleurae with punctures. All legs relatively slender, pro- and metafemora slightly thicker than mesofemur; ratio of femur : tibia : tarsus (tarsomeres 1, 2, 3) (relative to length of metatibia = 1): foreleg: 0.77 : 0.78 : 0.30 (0.04 : 0.06 : 0.20), middle leg: 1.09 : 0.99 : 0.79 (0.11 : 0.36 : 0.32), hind leg: 0.98 : 1.00 : 0.57 (0.09 : 0.23 : 0.25); protibia with grasping comb 0.54 times as long as tibia; metafemur ventrally with a row of very small, dark pegs, but without teeth (Fig. 17); metatibia without pegs. Forewing reaching apex of abdomen. Last segment of connexivum drawn out into a short, blunt process.

Genital segments. - Segment 8 cylindrical, ventrally with a transverse edge in basal third, ventro-laterally forming short, sharp processes (Fig. 9); proctiger oval, apically with dense, erect hairs; pygophore pear-shaped, with hind margin broadly rounded; paramere slender, falciform, and apically tapering (Fig. 19).

Female. - unknown.

Comparative notes. - *Angilia mazzoldii*, new species, is similar to *A. orientalis* Andersen, 1981 (from Thailand, Hong Kong, and the Philippines) and *A. philippiensis* Drake & Hoberlandt, 1953 (from the Philippines) but differs from both species in the following characters: pronotal lobe, metapleura, and sternites set with very long, dark hairs; pronotal lobe medially higher elevated (comp. Figs. 1 and 2); segment 8 of male with ventro-lateral processes (Fig. 9); paramere apically tapering (comp. Figs. 19 and 20).

Distribution. - Indonesia, eastern Kalimantan.

Etymology. - Named in honor of Paolo Mazzoldi (Brescia), specialist for Gyrinidae, who collected type specimens of all the new species presented in this paper.

Angilia (Adriennella) anderseni, new species

(Figs. 3, 7, 8, 12, 16, 21)

Material examined. - Holotype (male): INDONESIA: E-Kalimantan, W Samarinda, SW Melak, Sembuan env., leg. Mazzoldi (NMW), 11 Jul.1995.

Paratypes: 1 male, 2 females. INDONESIA, Borneo, Kalimantan Timur Prov., waterfall 4 km S. of Kota Bangun, CL 2095, leg. J.T. & D.A. Polhemus (JTPC), 29 Jul.1985.

Description of male (the larger specimen is the holotype). - Size. - Length 4.50 - 4.55 mm, maximum width (across pronotal humeri) 1.90 - 2.00 mm.

Colour. - Head light brown to dark brown, median impressed line shiny; antenna with apex of segments 1 and 2 and entire segments 3 and 4 brown, remaining parts light brown to yellow. Pronotal lobe either with anterior and posterior part light brown and with broad band between and in front of humeri slightly lighter, or entirely brown, two oblique furrows laterally on anterior part of pronotum dark brown. Legs with brown and yellow bands, faded on femora in the paratype specimen. Forewing brown, with veins on basal part slightly darker, outer basal cell with quadrangular to longitudinal white patch, discal cell with small white patch, distribution of white patches in apical part of wing as in figure 7. Connexivum brown to yellowish, tergites covered by wings. Pleurae and sternites dark brown, stripe on lateral margins of sternites lighter brown.

Pilosity. - Clypeus, vertex, antenna, pronotal lobe (Fig. 3), legs, meso- and metapleura, lateral edge of connexivum, distal process of last connexival segment, and sternites with long, erect, bristle-like hairs and shorter, dense, suberect pubescence. Forewing with erect hairs on subcosta, radius, media, cubitus, and crossvein, remaining parts hairless.

Structural characters. - Length of head 0.60 - 0.68 mm, width across eyes 1.03 - 1.05 mm, interocular width 0.50 - 0.53 mm. Antenna 0.70 - 0.72 times as long as body (length of antenna 3.15 - 3.28 mm), relative length of segments 1 - 4 as 0.91 - 0.92 : 0.73 - 0.74 : 1.00 : 0.89 - 0.94; segment 1 of antenna slightly curved, remaining segments straight. Pronotum 0.9 times as wide as long (length 2.20 - 2.30 mm); pronotal lobe strongly raised between humeri, with median short, low ridge; humeral angles drawn out into spine-like processes; hind margin of pronotum drawn out into a finger-like projection, apex strongly curved in lateral view (Figs. 3, 12); pronotum with two oblique furrows laterally on anterior part, and with punctures except on a transverse band near anterior margin, on elevations, and on finger-like projection, pleurae without punctures. Fore and middle legs slender, metafemur slightly incrassate; ratio of femur : tibia : tarsus (tarsomeres 1, 2, 3) (relative to length of hind tibia = 1): foreleg: 0.65 - 0.71 : 0.71 - 0.73 : 0.33 - 0.34 (0.04 : 0.10 - 0.11 : 0.18 - 0.20), middle leg: 0.91 - 0.96 : 0.97 - 1.00 : 0.66 - 0.68 (0.05 - 0.06 : 0.33 - 0.35 : 0.27 - 0.28), hind leg: 0.95 - 0.98 : 1.00 : 0.53 (0.05 : 0.25 - 0.27 : 0.21 - 0.23); protibia with grasping comb 0.67 - 0.71 times as long as tibia; metafemur ventrally with a row of small, dark pegs and with one relatively large and three smaller teeth (Fig. 16); metatibia ventrally also with a few very small pegs. Forewing reaching apex of abdomen. Last segment of connexivum drawn out into a spine-like process.

Genital segments. - Segment 8 small, cylindrical, ventrally with a transverse edge in middle of its length, ventro-laterally with bifid processes (Fig. 8); proctiger short and almost circular, apically with dense hairs; pygophore pear-shaped, with hind margin broadly rounded; paramere very slender, falciform, and strongly bent (Fig. 21).

Description of female. - Size.- Length 4.65 - 4.75 mm, maximum width (across pronotal humeri) 2.00 - 2.10 mm.

Colour. - Similar as in male. Head brown. Pronotal lobe entirely brown. Legs with brown and yellow bands, on tibiae and tarsi clearly demarcated, on femora more faded.

Pilosity. - Similar as in male.

Structural characters. - As in male except the following: Length of head 0.55 - 0.58 mm, width across eyes 1.07 - 1.08 mm, interocular width 0.52 - 0.53 mm. Antenna 0.69 - 0.7 times as long as body (length of antenna 3.20 - 3.30 mm), relative length of segments 1 - 4 as 0.92 - 0.95 : 0.69 - 0.73 : 1.00 : 0.92 - 0.94. Pronotum 0.84 - 0.88 times as wide as long (length 2.27 - 2.50 mm). Ratio of femur : tibia : tarsus (tarsomeres 1, 2, 3) (relative to length of hind tibia = 1): foreleg: 0.68 - 0.70 : 0.65 - 0.66 : 0.31 - 0.33 (0.02 - 0.04 : 0.10 : 0.19), middle leg: 0.86 - 0.87 : 0.93 - 0.94 : 0.64 - 0.65 (0.06 : 0.32 - 0.33 : 0.26), hind leg: 0.96 - 0.98 : 1.00 : 0.51 - 0.52 (0.05 : 0.25 - 0.26 : 0.20 - 0.22); protibia with grasping comb 0.16 times as long as tibia; metafemur ventrally with one large tooth and 3 - 4 smaller teeth or pegs; metatibia ventrally with two or three rows of pegs.

Genital segments. - Dorso-lateral margin of gonocoxa forming a very short process, bent mediad over base of proctiger (Fig. 23); gonocoxa and proctiger with dense, long, erect hairs.

Comparative notes. - *Angilia anderseni*, new species, is similar to *A. bispinosa* Andersen, 1981, because of the two lateral spines in the pronotal humeri and the slender falciform paramere, but is much smaller and has a more slender metafemur (comp. Figs. 15 and 16). The male of *Angilia anderseni*, new species, is easy recognizable by the pair of processes ventro-laterally on segment 8 (Fig. 8); the paramere is strongly bent to middle and more slender than in *A. bispinosa* (comp. Figs. 21 and 22).

Distribution. - Indonesia, eastern Kalimantan.

Etymology. - Named in honor of Dr. N.M. Andersen (Copenhagen), who revised the Oriental *Angilia* species and so laid the foundations for the present paper.

Angilia (Adriennella) borneensis, new species
(Figs. 4, 6, 10, 13, 18)

Material examined. - Holotype (male): INDONESIA: Kalimantan, nr. Ritan Bitan Baru, Melok Riv., leg. P. Mazzoldi (NMW); 27 Jul.1995.

Paratype: 1 female, same locality data (ZCW).

Description of female (the smaller specimen is the holotype). - Size. - Length 7.25 - 7.45 mm, maximum width (across pronotal humeri) 3.05 - 3.10 mm.

Colour. - Head light brown, median impressed line shiny; antenna light brown, with apex of segments 1 and 2 darker. Pronotal lobe with anterior and posterior part light brown, broad band between and in front of humeri yellow. Legs with brown and yellow bands, on tibiae and tarsi clearly demarcated, on femora more faded. Forewing brown, outer basal cell with large, longitudinal, quadrangular, white patch, discal cell with small white patch, distribution of white patches in apical part of wing as in figure 6. Connexivum light brown to orange-brown, tergites covered by wings. Pleurae and sternites dark brown, stripe on lateral margins of sternites light brown to orange-brown.

Pilosity. - Clypeus, vertex, antenna, pronotal lobe (Fig. 4), legs, matapleura, connexivum, distal process of last connexival segment, and sternites with long, erect, bristle-like hairs and shorter, dense, suberect pubescence. Forewing with erect hairs on subcosta, radius, media, cubitus, and crossvein, remaining parts hairless.

Structural characters. - Length of head 0.95 - 1.10 mm, width across eyes 1.35 mm, interocular width 0.70 mm. Antenna 0.67 - 0.72 times as long as body (length of antenna 5.00 - 5.25 mm), relative length of segments 1 - 4 as 1.04 - 1.08 : 0.86 - 0.88 : 1.00 : 0.86 - 0.88; segment 1 of antenna slightly curved, remaining segments straight. Pronotum 0.97 - 1.02 times as wide as long (length 3.00 - 3.05 mm); pronotal lobe strongly raised between humeri, medially with very stout, blunt cone, humeral angles drawn out into long spines; hind margin of pronotum drawn out into a finger-like projection, apex strongly curved in lateral view (Figs. 4, 13); pronotum with punctures except on a transverse band near anterior margin, on elevations, and on finger-like projection, pleurae without punctures. Fore and middle legs slender, metafemur slightly incrassate; ratio of femur : tibia : tarsus (tarsomeres 1, 2, 3) (relative to length of hind tibia = 1): foreleg: 0.67 - 0.70 : 0.70 - 0.74 : 0.32 - 0.33 (0.03 : 0.11 : 0.18), middle leg: 0.97 - 1.02 : 1.02 - 1.07 : 0.67 - 0.74 (0.05 : 0.41 - 0.42 : 0.21 - 0.28), hind leg: 0.97 - 1.02 : 1.00 : 0.58 - 0.59 (0.05 : 0.30 : 0.22 - 0.24); protibia with grasping comb 0.18 - 0.20 times as long as tibia; metafemur ventrally with a row of dark pegs and 4 - 5 more distinct teeth (Fig. 18), metatibia ventrally with 2 - 3 rows of pegs. Forewing not reaching apex of abdomen. Last segment of connexivum drawn out into a rather long, spine-like process.

Genital segments. - Dorso-lateral margin of gonocoxa drawn out into a short process (Fig. 10); gonocoxa and proctiger with dense, long, erect hairs.

Male. - unknown.

Comparative notes. - *Angilia borneensis*, new species, is similar to *A. trispinosa* Andersen, 1981, but has a blunt cone centrally on pronotum (Fig. 13) instead of a sharp spine (Fig. 14). As the type specimens of *A. borneensis*, new species, are slightly larger than the type of *A. trispinosa*, this character is regarded as useful, because a more developed spine in larger specimens should be expected, if this character would vary. Further, the female tibial comb of *A. borneensis* , new species. is distinctly shorter than in *A. trispinosa*, an additional white mark is situated in the discal cell of the forewing of *A. borneensis*, new species, and the gonocoxa of *A. borneensis*, new species, is dorsally more produced (comp. Fig. 10 with fig. 33 in Andersen 1981).

Distribution. - Indonesia, eastern Kalimantan.

Etymology. - Named after the occurance of the species in Borneo island.

SPECIES ARRANGEMENT

The Oriental *Angilia* fauna consists of two distinct species groups:

The *Angilia orientalis* group (containing *Angilia orientalis*, *A. philippiensis*, and *A. mazzoldii*, new species): pronotal humeri without spines; metafemur slender, only with short denticles ventrally; male with very large segment 8 and broad clasper with rounded or truncated apex.

The *Angilia bispinosa* group (containing *Angilia bispinosa*, *A. trispinosa* Andersen, 1981, *A. anderseni*, new species, and *A. borneensis*, new species): Pronotal humeri with spines; metafemur distinctly thickened, ventrally set with teeth; male (unknown in *A. trispinosa* and *A. borneensis*, new species) with segment 8 of moderate size, and with thin falciform clasper.

KEY TO THE ORIENTAL *ANGILIA* SPECIES

1 Pronotal humeri without spines, only with cone-like, truncated elevations (Fig. 11) 2
- Pronotal humeri with sharp spines (Figs. 12 - 14) 4

2 Pronotum centrally highly elevated, with longer hairs (Fig. 1); male with segment 8 ventro-laterally with sharp processes (Fig. 9); paramere relatively slender, apically tapering (Fig. 19) (Borneo) ..... *A. mazzoldii*, new species
- Pronotum centrally not highly elevated, with shorter hairs (Fig. 2); male with segment 8 ventro-laterally not produced; parameres with broader apex 3

3 Male with apex of paramere broadly rounded (Fig. 20); female with grasping comb longer than half length of protibia (Thailand, Hong Kong, Philippines) ..... *A. orientalis*
- Male with apex of paramere truncated; female with grasping comb shorter than half length of protibia (Philippines) ..... *A. philippiensis*

4 Pronotum centrally with a spine or cone (Figs. 13, 14) 5
- Pronotum centrally without a spine or cone (Fig. 12) 6

5 Pronotum centrally with a spine (Fig. 14); tibial comb of female more than one third length of protibia (? West Malaysia) ..... *A. trispinosa*
- Pronotum centrally with a cone (Fig. 4, 13); tibial comb of female one fifth length of protibia (Borneo) ..... *A. borneensis*, new species

6 Body length 4.6 mm; male with segment 8 ventro-laterally with a pair of bifid processes (Fig. 8); paramere very slender (Fig. 21) (Borneo) ..... *A. anderseni*, new species
- Body length 6.8 - 7.2 mm; male with segment 8 ventro-laterally without a pair of processes; paramere slightly stouter (Fig. 22) (Thailand) ..... *A. bispinosa*

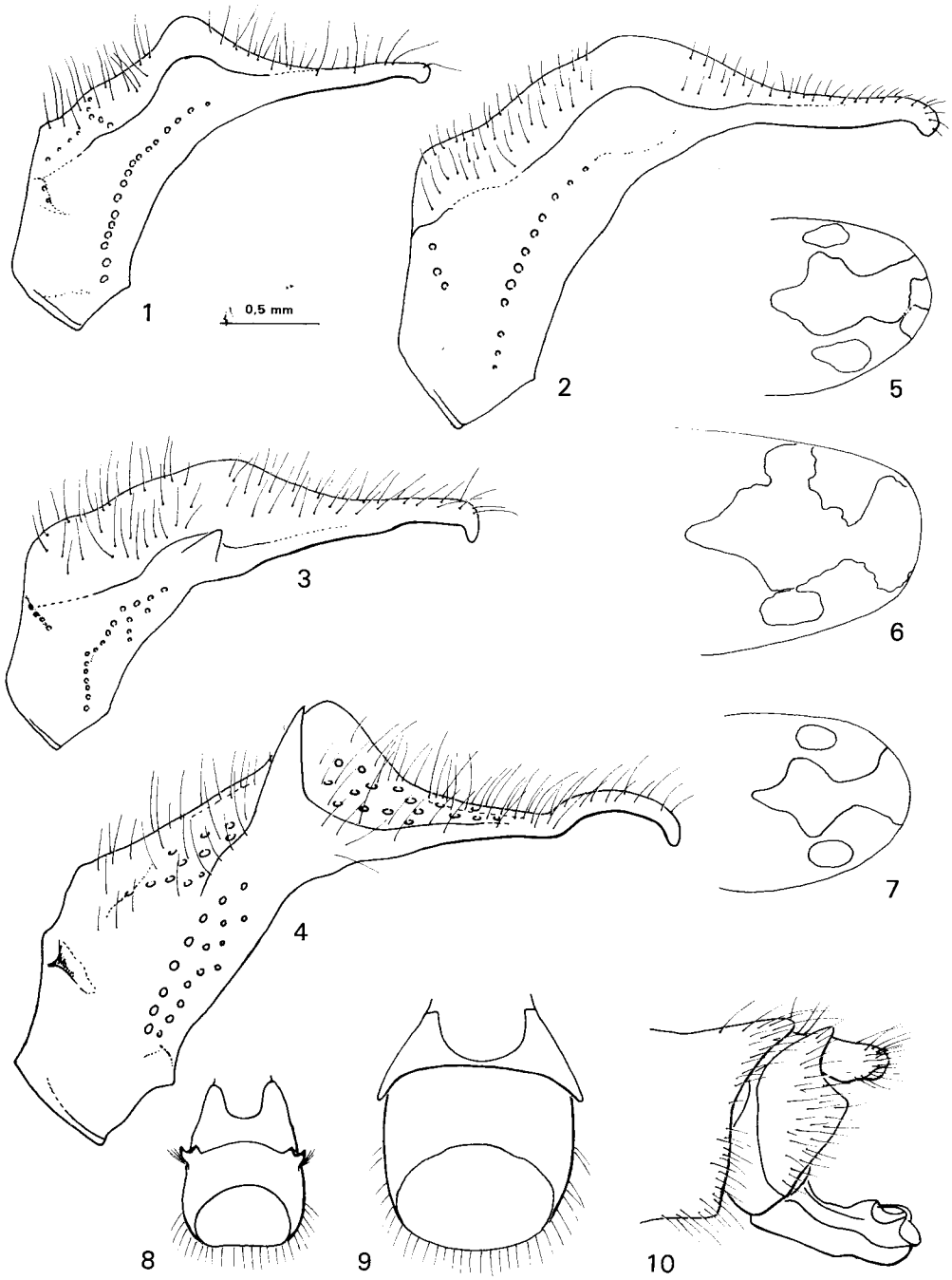
FAUNISTICAL NOTES

The Oriental *Angilia* species are rarely collected. Distribution data are scarce. For comparison the following material was available:

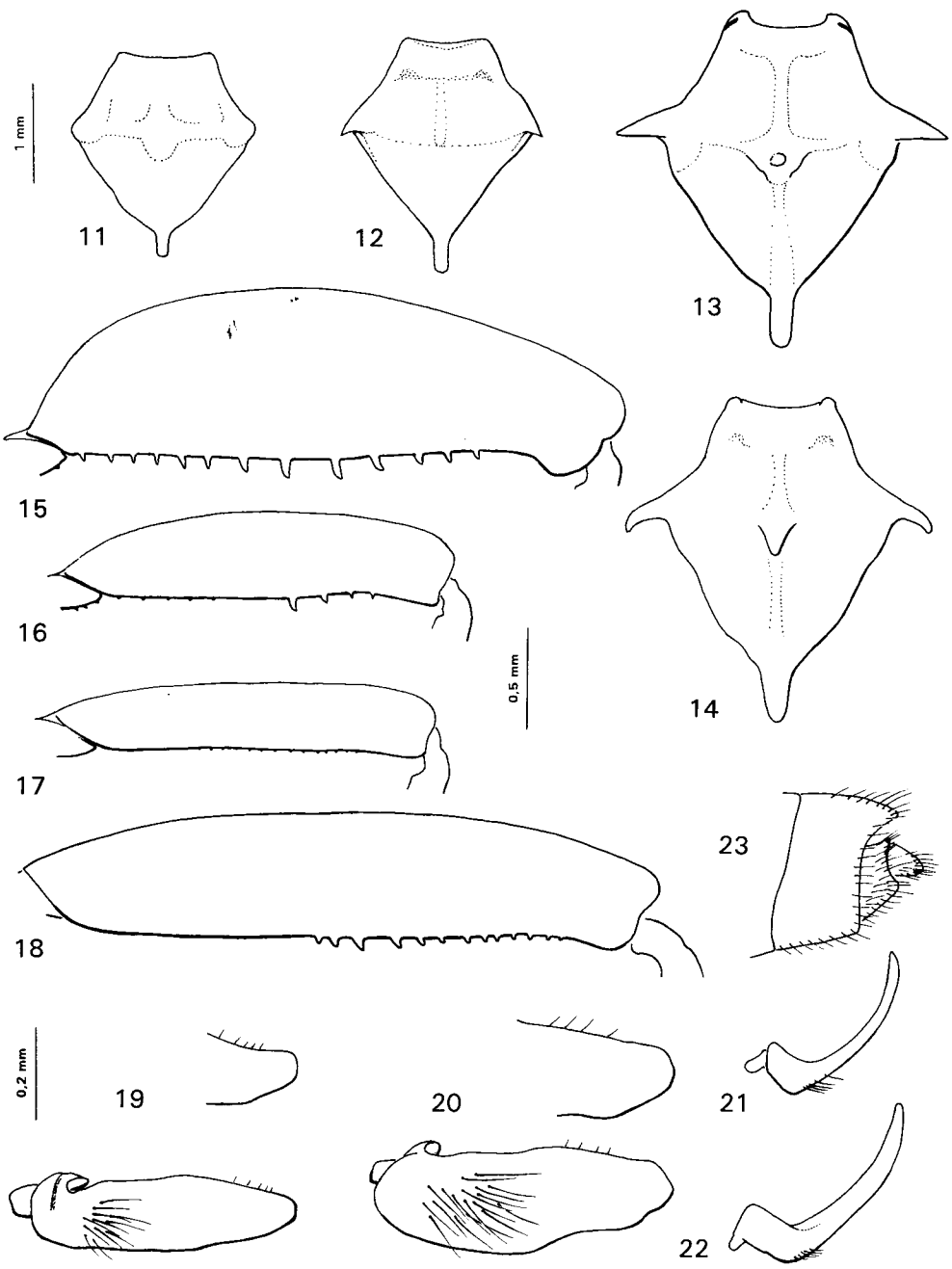
Angilia bispinosa Andersen, 1981

(Figs. 15, 22)

Material examined. - 1 male, THAILAND 1990 (14), Prov. Rayong, Khao Chamao NP, leg. Jäch 12./13.12. (NMW).



Figs. 1 - 10. (1 - 4) Pronotum, lateral view of (1) *A. mazzoldii*, new species, (2) *A. orientalis*, (3) *A. anderseni*, new species, and (4) *A. borneensis*, new species; (5 - 7) outline of white spots on apex of forewing of (5) *A. mazzoldii*, new species, (6) *A. borneensis*, new species, and (7) *A. anderseni*, new species; (8 - 9) male segment 8, ventral view, of (8) *A. anderseni*, new species, and (9) *A. mazzoldii*, new species; (10) female genitalia, lateral view, of *A. borneensis*, new species.



Figs. 11 - 23. (11 - 14) Pronotum, dorsal view, of (11) *A. mazzoldii*, new species, (12) *A. anderseni*, new species, (13) *A. borneensis*, new species, and (14) *A. trispinosa* (after Andersen, 1981; different scale); (15 - 18) metafemur (hairs omitted) of (15) *A. bispinosa*, (16) *A. anderseni*, new species, (17) *A. mazzoldii*, new species, and (18) *A. borneensis*, new species; (19 - 22) left paramere, lateral view (19, 20: apex in front view added), of (19) *A. mazzoldii*, new species, (20) *A. orientalis*, (21) *A. anderseni*, new species, and (22) *A. bispinosa*; (23) female genitalia, lateral view, of *A. anderseni*, new species.

Angilia orientalis Andersen, 1981
(Figs. 2, 20)

Material examined. - 1 male, THAILAND: Chiang Mai Prov., Chiang Dao, Ban Yang Thung, Pong, 500 m, leg. H. Zettel (10), (NMW), 8 Nov.1995; 1 male, THAILAND: Phrae Prov., 50 km NE Phrae, Huai Kaet, leg. H. Zettel (17a) (NMW), 17 Nov.1995; 3 males, PHILIPPINES: Palawan Pr., Busuanga Is., 13 rd km WNW, Coron, Balulu Falls, leg. H. Zettel (81) (UPLB, ZCW), 24 Feb.1996.

Note. We could not find any important difference between *A. orientalis* specimens from North Thailand and from Busuanga Island, Philippines. We can interpret A. *philippiensis* only after the original description, which includes drawings of parameres, which seem to have a truncated apex (Drake & Hoberlandt, 1953). Andersen (1981) compared females of both species and found differences in the grasping comb on the protibia and the white patches on the forewing. As Busuanga Island is a northern outpost of the Sunda Shelf, but Mindoro and Luzon (from where *A. philippiensis* is reported) belong to the Philippine faunal region, the Mindoro Strait may be the distributional border between these very closely related species.

ACKNOWLEDGEMENTS

We thank Mr. Paolo Mazzoldi (Brescia, Italy) for the holotypes now deposited in NMW and Dr. John T. Polhemus (Colorado) for further material for this study. Our thanks are due to Dr. John T. Polhemus and Dr. Nils Møller Andersen (Zoological Museum and University, Copenhagen) for comments on the manuscript, and to Prof. Dr. William D. Shepard (California State University, Sacramento) for a linguistic review. The senior author especially thanks Mrs. Jessamyn Recuenco-Adorada, Prof. Dr. Victor P. Gapud, and Prof. Dr. Augusto C. Sumalde (all in University of the Philippines, Los Baños), Dr. Tasanee Jamjanya, Dr. Yupa Hanboonsong, and Dr. "Lek" Narumon Sangpradub (all in Khon Kaen University), who supported his field work in the Philippines and Thailand, respectively.

LITERATURE CITED

Andersen, N.M., 1981. A new genus of Veliinae and descriptions of new Oriental species of the subfamily (Hemiptera: Veliidae). *Entomol. Scand.* **12**: 339-356.

Drake, C.J. & H. Hoberlandt, 1953. A new species of the genus *Angilia* from the Philippines, with a catalogue of the described species (Hemiptera: Veliidae). *Pan-Pac. Entomol.* **29**(4): 223-227.

Polhemus, D.A., 1997. Systematics of the Genus *Rhagovelia* Mayr (Heteroptera: Veliidae) in the Western Hemisphere (Exclusive of the *angustipes* Complex). Thomas Say Publications in Entomology: Monographs. Entomological Society of America, Lanham, Maryland, ii+386 pp.

Polhemus, J.T. & D.A. Polhemus, 1990. Zoogeography of the aquatic Heteroptera of Celebes: regional relationships versus insular endemism, pp. 73-86, in: Knight, W.J. & J.D. Holloway, (eds.): *Insects and the rain forests of South East Asia (Wallacea)*, Royal Entomological Society London, London, IV + 343 pp.

Zettel, H., 1995. Zwei neue Arten der Gattung *Tetraripis* Lundblad aus Borneo (Heteroptera: Veliidae). *Zeitschr. Arb.gem. Österr. Entomologen* **47** (1/2): 25-30.