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Additional notes on the Aphelocheiridae, Naucoridae, and Notonectidae (Insecta: Heteroptera: Nepomorpha) of the Philippine Islands

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Abstract

Taxonomic and distributional notes on Philippine species of Aphelocheiridae, Naucoridae, and Notonectidae are presented. The following three species and one subspecies are newly described: *Stalocoris bicolanus bicolanus* sp.n., *S. bicolanus ruizi* ssp.n. (from South Luzon) and *Stalocoris rarosae* sp.n. (from Leyte) of the family Naucoridae; *Enithares nieseri* sp.n. (from northeastern Mindanao) of the family Notonectidae. The macropterous morph of *Aphelocheirus gapudi* ZETTEL, 1999 and *A. zamboanga luzonicus* POLHEMUS & POLHEMUS, 1989 and the female of *A. gapudi* (Aphelocheiridae) are described for the first time. Distributional data of eighteen additional species and two additional subspecies are provided. The following first island records are presented: Aphelocheiridae: *Aphelocheirus gapudi* ZETTEL, 1999 and *A. zamboanga zamboanga* POLHEMUS & POLHEMUS, 1989 from Leyte; Naucoridae: *Naucoris pumilus* ZETTEL, NIESER & POLHEMUS, 1999 from Samar; Notonectidae: *Enithares bakeri* BROOKS, 1948 from Poro (Camotes group); *Enithares martini martini* KIRKALDY, 1898 from Leyte; *Nychia* cf. *sappho* KIRKALDY, 1901 from Sibuyan, Masbate, Samar, and Leyte; *Anisops stali* KIRKALDY, 1904 from Mindoro; *Anisops kuroiwae* MATSUMURA, 1915 from Mindoro, Panay, Negros, Catanduanes, Samar, Leyte, and Palawan; *Anisops rhomboides* NIESER & CHEN, 1999 from Palawan.

Key words: Heteroptera, Aphelocheiridae, Naucoridae, Notonectidae, *Aphelocheirus*, *Naucoris*, *Laccocoris*, *Asthenocoris*, *Philippinocoris*, *Stalocoris*, *Enithares*, *Nychia*, *Anisops*, new species, new subspecies, first record, Philippines.

Zusammenfassung

Neue Kenntnisse zur Taxonomie und Verbreitung philippinischer Arten der Familien Aphelocheiridae, Naucoridae und Notonectidae werden präsentiert. Drei Arten und eine Unterart werden neu beschrieben: *Stalocoris bicolanus bicolanus* sp.n., *S. bicolanus ruizi* ssp.n. (von Süd-Luzon) und *Stalocoris rarosae* sp.n. (von Leyte) aus der Familie Naucoridae; *Enithares nieseri* sp.n. (von Nordost-Mindanao) aus der Familie Notonectidae. Die makroptere Form von *Aphelocheirus gapudi* ZETTEL, 1999 und *A. zamboanga luzonicus* POLHEMUS & POLHEMUS, 1989 und das Weibchen von *A. gapudi* (Aphelocheiridae) werden erstmals beschrieben. Verbreitungsdaten von weiteren achtzehn Arten und zwei Unterarten werden bekannt gemacht. Die folgenden ersten Insel-Nachweise werden präsentiert: Aphelocheiridae: *Aphelocheirus gapudi* ZETTEL, 1999 und *A. zamboanga zamboanga* POLHEMUS & POLHEMUS, 1989 für Leyte; Naucoridae: *Naucoris pumilus* ZETTEL, NIESER & POLHEMUS, 1999 für Samar; Notonectidae: *Enithares bakeri* BROOKS, 1948 für Poro (Camotes Gruppe); *Enithares martini martini* KIRKALDY, 1898 für Leyte; *Nychia* cf. *sappho* KIRKALDY, 1901 für Sibuyan, Masbate, Samar und Leyte; *Anisops stali* KIRKALDY, 1904 für Mindoro; *Anisops kuroiwae* MATSUMURA, 1915 für Mindoro, Panay, Negros, Catanduanes, Samar, Leyte und Palawan; *Anisops rhomboides* NIESER & CHEN, 1999 für Palawan.

Introduction

This paper deals with various records of the families Naucoridae, Aphelocheiridae, and Notonectidae (Nepomorpha), mostly from the author's last expeditions to the Philippines

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in 2000 - 2002. These studies investigated the distributions of water bug species in the eastern island arch between southern Luzon and northeastern Mindanao, with special attention to Samar and Leyte, and with first records of water bugs from Dinagat, Maripipi, and the Camotes group. During the Pleistocene Epoche, the eastern island arch probably formed a nearly continuous land bridge from the northern to the southern Philippine Islands, with a narrow gap between todays Sorsogon Peninsula of Luzon and Northern Samar (see ZETTEL & al. 1999: fig. 152), which separated "Greater Luzon" from "Greater Mindanao" (terminology from HEANEY 1991). New records of aquatic and semiaquatic Heteroptera provide interesting aspects of distributional patterns within the Philippines, e.g., evidence of a zoogeographical subdivision of the island of Samar.

Additional material included in this study has been collected in the province of Camarines Sur (South Luzon) by a group of entomologists from the Camarines Sur State Agricultural College (CSSAC) headed by Prof. Raul B. Ruiz (for complete list of names see Acknowledgements). Their samplings are especially rich in some previously rarely encountered species of Aphelocheiridae and Naucoridae, including one new subspecies of *Stalocoris*.

The families treated here have been studied recently in the first part of the "Philippine Water Bug Inventory Project" (see GAPUD & ZETTEL 1999): the Naucoridae by ZETTEL & al. (1999), the Aphelocheiridae by ZETTEL (1999) and the genus *Enithares* SPINOLA, 1837 of the Notonectidae by NIESER & ZETTEL (1999). The remaining genera and species of Notonectidae are listed in this paper; records recently published by NIESER & CHEN (1999) are cited.

Terminology follows NIESER & ZETTEL (1999), ZETTEL (1999), and ZETTEL & al. (1999). Maximum body width in the Naucoridae can be across the embolia or across the abdomen, depending on the slightly varying width of the abdomen.

Repositories:

CSSAC	Camarines Sur State Agricultural College, Pili, Camarines Sur, Philippines
CZW	Coll. H. & S.V. Zettel, Vienna, Austria
NCTN	Coll. N. Nieser, Tiel, The Netherlands
NHMW	Naturhistorisches Museum in Wien, Vienna, Austria
UPLB	Museum of Natural History, University of the Philippines, Los Baños, Laguna, Philippines
USCC	University of San Carlos, Biological Collection, Cebu City, Philippines
ViSCA	Visayas State College of Agriculture, Baybay, Leyte, Philippines
ZIAS	Zoological Institute, Academy of Sciences, St. Petersburg, Russia
ZRCS	Raffles Museum (Zoological Reference Collection), National University of Singapore

Family Aphelocheiridae

Notes: The family contains only one genus, *Aphelocheirus* WESTWOOD, 1833. ZETTEL (1999) recognized eight species and two subspecies, which are endemic in the Philippines, and presented a key to the Philippine species. The revision by POLHEMUS & POLHEMUS appeared in 1989, and not in 1988, which must be considered in the correct citation of the

following species group taxa: *A. baguio* POLHEMUS & POLHEMUS, 1989, *A. palawanensis* POLHEMUS & POLHEMUS, 1989, *A. sculpturatus* POLHEMUS & POLHEMUS, 1989, *A. zamboanga zamboanga* POLHEMUS & POLHEMUS, 1989, and *A. zamboanga luzonicus* POLHEMUS & POLHEMUS, 1989.

Aphelocheirus gapudi ZETTEL, 1999 (Figs. 1, 3 - 5)

Aphelocheirus gapudi ZETTEL, 1999: 110.

Additional material examined: 2 ♀♀ (macropterous) "Philippinen: Luzon,\ Camarines Sur, Lupi,\ Alanao, Bahi River [border with Camarines Norte],\ 10.3.2000,lg. Zettel (245)" (CZW); 3 ♂♂, 4 ♀♀ (macropterous) "Philippinen: LZ, Cama-/ rines Sur, Lupi, Alanao/ Bahi River, 10.2.2002/ leg. H. Zettel (307)" (CZW, UPLB, NHMW); 4 ♂♂ (brachypterous) from Camarines Sur, Pili, Buncao, Himaao Creek, 8.IX.2001, leg. R.V. Almazar, I.C. Fabricante & I.P. Ibo (CSSAC); 2 ♂♂, 3 ♀♀ (brachypterous) "Philippinen: Luzon, Cama-/ rines Sur, Pili, Buncao,/ Caririga Creek, 1.2.2002/ leg. H. Zettel (301)" (CZW, UPLB); 2 ♂♂ (brachypterous), same locality, 14.VII.2001, leg. R.V. Almazar, I.C. Fabricante & I.P. Ibo (CSSAC); 1 ♀ (brachypterous) from Camarines Sur, Goa, Digdigon, Salog River, 13.IX.2001, leg. R.V. Almazar, I.C. Fabricante & I.P. Ibo (CSSAC); 25 ♂♂, 32 ♀♀ (brachypterous), 2 ♀♀ (macropterous) "Philippines: Camarines Sur\ Carolina, Inarihan River,\ Jan. 5, 2002, leg. R.V. Almazar,\ I.C. Fabricante & I.P. Ibo" (CSSAC, NHMW, CZW); 1 ♂, 1 ♀ (macropterous, dealate) "PHILIPPINES: Leyte\ Mt. Pangasugan,\ Morabong, 29.V.1998,\ leg. Arnulfo Almeroda" (ViSCA).

Description:

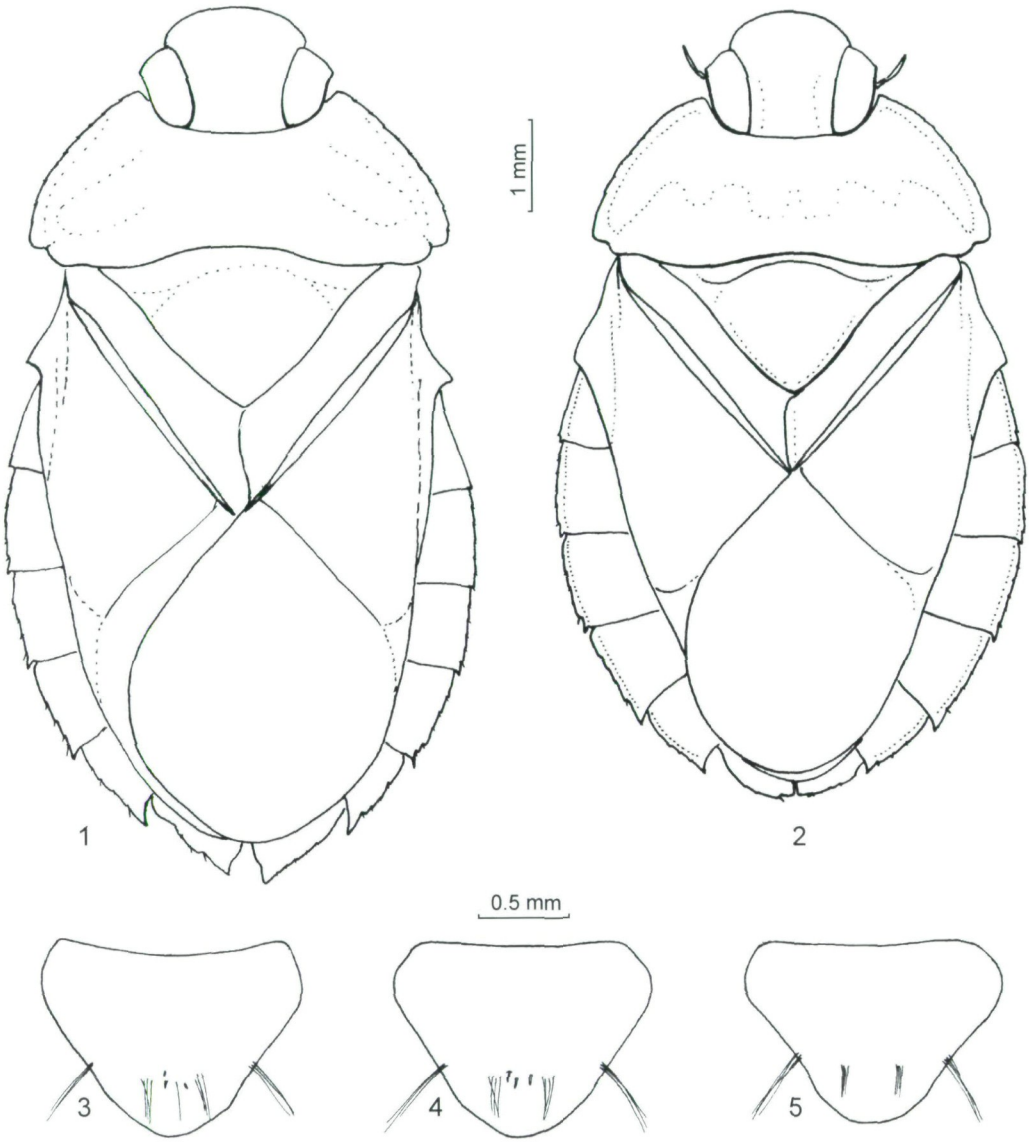
Macropterous female (after specimens deposited in NHMW, CZW, and ViSCA): size: body length 8.3 - 8.9 mm; maximum body width (at abdominal segment 3) 4.6 - 4.9 mm; pronotal width 4.1 - 4.4 mm.

Colour: dorsal aspect of body blackish brown, with head along eyes, disc and hind margin of pronotum, and variable part of clavus light brown; mesoscutellum light to dark brown, rostrum, legs, and lateral parts of posterior connexiva yellow.

Structural characteristics: dorsal body shape as in Figure 1; pronotum width 3.5 times median length, with angulately incised posterior corners; mesoscutellum large; hemelytron with small, projecting embolar corner; structure of mesosternum strongly flattened, as typical for macropterous form; abdomen nearly symmetrical; sternite 4 with 5, sternites 5 and 6 with 6 peglike setae; sternite 7 (Figs. 3 - 5) subtriangular with straight to weakly convex sides and rounded apex, with four hair tufts approximately located in a transverse row, medially with or without very small peglike setae, with or without median bristle; interior corners of abdominal segment 7 acute (Fig. 1).

Macropterous male (after specimens deposited in ViSCA and CZW): size: body length 8.2 - 8.4 mm; maximum body width (at abdominal segment 3) 4.5 - 4.8 mm; pronotal width 4.0 - 4.3 mm; characteristics as in brachypterous male (ZETTEL 1999) except colour, shape of pronotum, mesoscutellum, hemelytron, and mesosternum as in macropterous female.

Brachypterous female (after specimens deposited in NHMW and CZW): most characteristics as in brachypterous male (see ZETTEL 1999) or macropterous female, respectively. Size: body length 8.0 - 8.8 mm; maximum body width (at abdominal segment 3) 4.6 - 5.1 mm; pronotal width 4.0 - 4.3 mm; subgenital plate with or, more frequently, without peg-like setae.



Figs. 1 - 5: (1, 3 - 5): *Aphelocheirus gapudi*, macropterous females (1, 3, 4: females from Bahi River, Camarines Sur, 5: female from Leyte); (2) *A. zamboanga luzonicus*, macropterous female; (1, 2) dorsal aspect, legs omitted; (2 - 4) subgenital plates (fine pilosity omitted).

Notes: This rare species has been described from two brachypterous males. The female and the macropterous morph are here described for the first time. Females of *A. gapudi* and *A. baguio* POLHEMUS & POLHEMUS, 1989 differ slightly in the shape of the subgenital plate, which in *A. gapudi* is relatively longer and with the apex more angulate than in

A. baguio. Subgenital plates of the females of *A. gapudi* vary in the presence or absence of peg-like setae and of a long median bristle (e.g., Figs. 3 - 5) between specimens of the same populations. The first characteristic has been regarded as diagnostically important for other species (ZETTEL 1999). Unfortunately, the present material from Leyte is not sufficient. It may happen that future knowledge on the brachypterous morph will provide differences between specimens from Luzon and Leyte, which justify a subspecific status of the Leyte population.

Distribution: South Luzon (Camarines Sur, Albay) (ZETTEL 1999); first records from Camarines Norte in Luzon and from Leyte (Leyte).

Aphelocheirus venus ZETTEL, 1999

Aphelocheirus venus ZETTEL, 1999: 108.

Additional material examined: 2 ♂♂, 2 ♀♀ (brachypterous) "Philippinen: Luzon,\ Camarines Sur, Lupi,\ Alanao, Bahi River, [border with Camarines Norte]\ 10.3.2000,lg. Zettel (245)" (CZW); 1 ♂ (brachypterous), 1 ♂, 1 ♀ (macropterous) "Philippinen: LZ, Cama-/ rines Sur, Lupi, Alanao/ Bahi River, 10.2.2002/ leg. H. Zettel (307)" (CZW); 58 ♂♂, 39 ♀♀ (brachypterous), 2 ♂♂ (macropterous) "Philippines: Camarines Sur\ Carolina, Inarihan River,\ Jan. 5, 2002, leg. R.V. Almazar,\ I.C. Fabricante & I.P. Ibo" (CSSAC, NHMW, CZW); 12 ♂♂, 7 ♀♀ (brachypterous) "Philippinen: Luzon, Cama-/ rines Sur, Pili, Buncao,/ Caririga Creek, 1.2.2002/ leg. H. Zettel (301)" (CZW, NHMW, UPLB); 21 ♂♂, 10 ♀♀ (brachypterous), 2 ♂♂, 1 ♀ (macropterous), same locality, 30.XI.2001, leg. R.V. Almazar, I.C. Fabricante & I.P. Ibo (CSSAC); 2 ♂♂ (brachypterous) from same locality, July 14, 2001, same collectors (CSSAC); 5 ♂♂, 2 ♀♀ (brachypterous) "Philippinen: Luzon, Cama-/ rines Sur, Pili, Buncao,/ Himaao Creek, 1.2.2002/ leg. H. Zettel (302)" (CZW, UPLB); 12 ♂♂, 10 ♀♀ (brachypterous), same locality, 30.XI.2001, leg. R.V. Almazar, I.C. Fabricante & I.P. Ibo (CSSAC); 27 ♂♂, 3 ♀♀ (brachypterous), same locality, 8.IX.2001, same collectors (CSSAC).

Notes: Colour of the hemelytra varies considerably among the large number of specimens now available for study. in addition to typical specimens with broad yellow marks, there are also a few with weakly brightened hind margin. Therefore, it turns out that colouration is no longer a safe distinguishing characteristic between *A. venus* and *A. uichancoi* USINGER, 1938.

Distribution: South Luzon (Camarines Sur) (ZETTEL 1999); first record from Camarines Norte.

Aphelocheirus zamboanga zamboanga POLHEMUS & POLHEMUS, 1989

Aphelocheirus zamboanga POLHEMUS & POLHEMUS, 1989: 212.
Aphelocheirus zamboanga zamboanga: ZETTEL 1998: 90, 94; ZETTEL 1999: 116.

Additional material examined: 2 ♂♂, 3 ♀♀ (brachypterous) "Philippinen: N. Samar\ Veriato, El Amigo\ Veriato Falls, 25.1.2000\ leg. H. Zettel (217)" (NHMW, UPLB); 2 ♂♂, 2 ♀♀ brachypterous "Philippinen: Leyte\ Makinhas, river\ 15.2.2000\ leg. H. Zettel (239)" (NHMW, ViSCA); 1 ♂, 1 ♀ (brachypterous), 2 ♂♂, 4 ♀♀ (macropterous) "Philippinen: Mindanao\ Surigao d.N., Matinao Riv.\ E Mainit, 8.2.2000\ leg. H. Zettel (232)" (NHMW, UPLB).

Distribution: Mindanao (Zamboanga del Sur, Bukidnon, Davao, South Cotabato) (POLHEMUS & POLHEMUS 1989, ZETTEL 1998); Samar: Northern Samar (ZETTEL 1999); here newly recorded from Surigao del Norte (Mindanao) and from Leyte.

Aphelocheirus zamboanga luzonicus POLHEMUS & POLHEMUS, 1989 (Fig. 2)

Aphelocheirus luzonicus POLHEMUS & POLHEMUS, 1989: 212.
Aphelocheirus zamboanga luzonicus: ZETTEL 1999: 116.

Additional material examined: 10 ♂♂, 9 ♀♀ (brachypterous), 1 ♀ (macropterous) "Philippinen: Sorsogon\ Guinlajon W Sorsogon\ City, 23.1.2000\ leg. H. Zettel (215)" (NHMW, UPLB, ZIAS); 1 ♂, 2 ♀♀ (brachypterous) "Philippinen: LZ, Cama-/ rines Sur, Lupi, Alanao/ Bahi River [border with Camarines Norte], 10.2.2002/ leg. H. Zettel (307)" (CZW); 1 ♀ (brachypterous) "Philippinen: Luzon, Cama-/ rines Sur, Pili, Buncao,/ Himaao Creek, 1.2.2002/ leg. H. Zettel (302)" (CZW); 1 ♂, 1 ♀ (brachypterous) "Philippinen: Luzon, Cama-/ rines Sur, Pili, Buncao,/ Caririga Creek, 1.2.2002/ leg. H. Zettel (301)" (CZW); 1 ♀ (brachypterous), same locality, 14.VII.2001, leg. R.V. Almazar, I.C. Fabricante & I.P. Ibo (CSSAC); 3 ♀♀ (brachypterous), 9 ♂♂, 2 ♀♀ (macropterous), same locality, 30.XI.2001, same collectors (CSSAC); 20 ♂♂, 31 ♀♀ (brachypterous), 4 ♂♂, 3 ♀♀ (macropterous) "Philippines: Camarines Sur\ Carolina, Inarihan River,\ Jan. 5, 2002, leg. R.V. Almazar,\ I.C. Fabricante & I.P. Ibo" (CSSAC); 24 ♂♂, 19 ♀♀ (brachypterous) from Camarines Sur, Goa, Digdigon, Salog River, 13.IX.2001, leg. R.V. Almazar, I.C. Fabricante & I.P. Ibo (CSSAC); 10 ♂♂, 9 ♀♀ (brachypterous) from same barangay, Linab Creek, same date, same collectors (CSSAC); 2 ♂♂, 2 ♀♀ (brachypterous) from Camarines Sur, Ragay, Tanawan, Banga, Malinaw River, 12.I.2002, leg. Ryan B. Ruiz & Allan B. Del Rosario (CSSAC).

Notes: The status of this taxon has been discussed by ZETTEL (1999). Previously, only brachypterous specimens of *A. z. luzonicus* have been found. Numerous macropterous specimens are deposited in CSSAC, but have not been available for description. Descriptive notes on the macropterous female from Sorsogon (in NHMW) are here presented.

Description of macropterous female: size: body length 8.5 mm; maximum body width (at abdominal segment 3) 5.3 mm; pronotal width 4.4 mm; dorsal aspect as in Figure 5; pronotum width 3.4 times median length, with angulately incised posterior corners; mesoscutellum large; hemelytron with small, projecting embolar corner; mesosternum not distinctly keeled, as typical for macropterous form; without form-typical differences to macropterous females of the nominotypical subspecies.

Distribution: Luzon: Pampanga, Cavite, Camarines Sur, Albay; Catanduanes (POLHEMUS & POLHEMUS 1989, ZETTEL 1999); first records from Camarines Norte and Sorsogon, Luzon.

Family Naucoridae

Notes: According to ZETTEL & al. (1999) the Naucoridae contains five genera, fourteen species and three subspecies in the Philippines. Two new species and one new subspecies of *Stalocoris* are added in this paper. All except one species, *Thurselinus scutellaris*, are endemic. ZETTEL & al. (1999) treated *Thurselinus scutellaris* within the genus *Naucoris*, but *Thurselinus* has been re-established by ZETTEL (2001). An updated inventory of Philippine Naucoridae includes six genera, sixteen species, and four subspecies.

Laccocoris hoogstraali LA RIVERS, 1970

Laccocoris hoogstraali LA RIVERS, 1970: 269; POLHEMUS & POLHEMUS 1987: 269; ZETTEL & al. 1999: 54.

Additional material examined: 1 ♂ (brachypterous), 1 immature "Philippinen: Leyte\ Hilusig, rivers\ 14.2.2000\ leg. H. Zettel (238)" (NHMW, UPLB); 2 ♂♂, 4 ♀♀ (brachypterous) "Philippinen: Leyte,\ rivers at Hilusig,\ 6.3.2001\ leg. H. Zettel (295)" (NHMW, UPLB); 1 ♀ (brachypterous) "PHILIPPINES\ Leyte: Abuyog\ Balin Sasayao\ 23-XI-85 LACR,\ IMJPC & AMA", "ex:\ Kapakuan\ creek" (ViSCA).

Notes: ZETTEL & al. (1999) presented numerous records from Mindanao; POLHEMUS & POLHEMUS (1987) recorded this species from Leyte, but without detailed collection data. The above mentioned material represents the first specimens from Leyte, which have been studied by the author. No differences between specimens from Leyte and Mindanao were observed.

Distribution: Leyte (Leyte); Mindanao (Zamboanga del Sur, Misamis Occidental, Lanao del Norte, Bukidnon, Davao, South Cotabato, Sarangani).

Thurselinus scutellaris (STÅL, 1860)

Naucoris scutellaris STÅL, 1860: 266; LUNDBLAD 1933: 63 (for further synonymies see in this publication); NIESER & CHEN 1991: 53; ZETTEL & al. 1999: 58.
Thurselinus scutellaris: ZETTEL 2001: 1092.

Additional material examined: 1 ♂ (brachypterous) "Los Banos\ P.I. Baker" (ZIAS).

Notes: ZETTEL (2001) separated *Thurselinus* from *Naucoris* by two characteristics: The spine-like produced hind corners of abdominal connexiva and the spiny setae on the left paramere of the male.

Distribution: Oriental Region and Wallacea; Philippines: Luzon (Laguna), Catanduanes, Ticao, Leyte, Mindanao (South Cotabato, Sarangani), Busuanga.

Naucoris pumilus ZETTEL, NIESER & POLHEMUS, 1999

Naucoris pumilus ZETTEL, NIESER & POLHEMUS, 1999: 61.

Material examined: 1 ♂ (brachypterous) "Philippinen: Sorsogon\ Ticol W Sorsogon City\ 23.1.2000\ leg. H. Zettel (214)" (NHMW); 1 ♀ (brachypterous) "Philippinen: N. Samar\ San Joaquin, Lologayan\ Falls, 27.1.2000\ leg. H. Zettel (219b)" (NHMW).

Distribution: Luzon, Polillo, Marinduque, Ticao, Masbate, Leyte (ZETTEL & al. 1999); first records from Sorsogon Province in Luzon and from Samar.

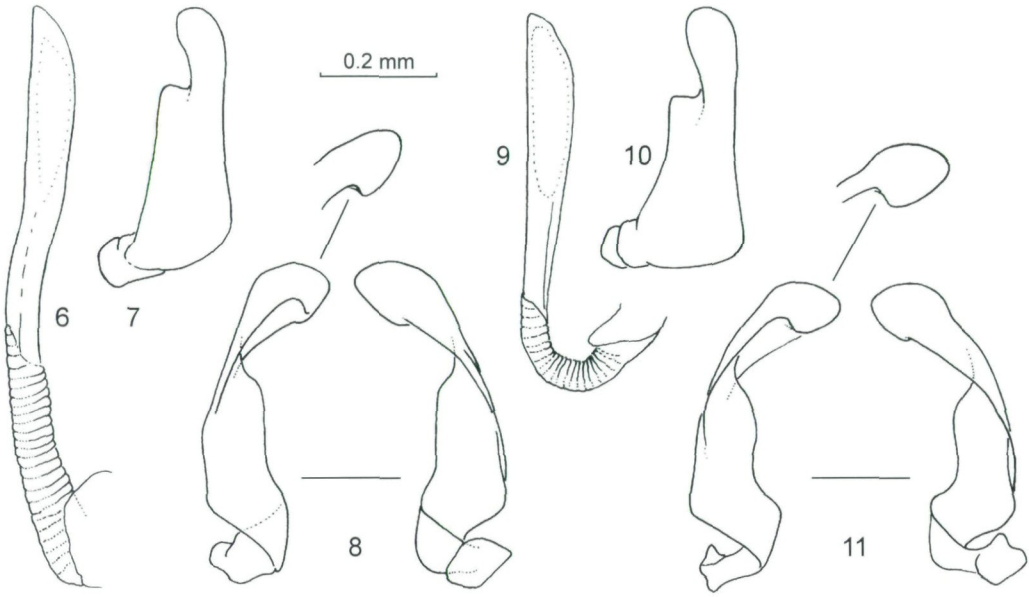
Stalocoris bicolanus bicolanus sp.n. (Figs. 6 - 8, 12, 14, 15)

Holotype (brachypterous male): "Philippinen: Sorsogon\ Ticol W Sorsogon City\ 23.1.2000\ leg. H. Zettel (214)" (UPLB); **paratypes:** 10 ♂♂, 5 ♀♀ (brachypterous), same label data (NHMW, UPLB).

Description:

Brachypterous male: size: body length 6.1 - 6.6 mm; maximum body width (at embolar margin or abdominal segment 4): 3.65 - 3.9 mm; pronotal width: 3.3 - 3.4 mm.

Colour: head and pronotum yellow, head in middle at most diffusely and inconspicuously darkened, anterior and posterior margin of pronotum blackish; mesoscutellum and hemelytron blackish, hemelytron with yellow marks on anterior half of embolium and apex of clavus, corium distally with small triangular yellow patch or very small yellow dot; abdomen dorsally infuscated, with yellow connexiva; ventral surface yellowish, on metathorax and abdomen more or less infuscated; labrum, rostrum, antenna, and legs yellow.



Figs. 6 - 11: *Stalocoris*: male genitalia: (6 - 8) *S. bicolanus bicolanus* sp.n., (9 - 11) *S. rarosae* sp.n.; (6, 9) aedeagus, (7, 10) left paramere, (8, 11) right paramere, two different views and apex in full face view (pilosity omitted).

Structural characteristics: head dorsally reticulate, with relatively small meshes, weakly shining; head width across eyes 1.7 times head length, head in front of eyes 0.10 times head length; synthlipsis 0.65 times head width across eyes; labrum inserted close to anterior margin of head, at anterior margin of rostral cavity, twice as wide as long; ventral extension of maxillary plate anteriorly subequal half length of labrum; rostral cavity semicircular, anteriorly weakly convex; rostrum short, segment 3 about 1.1 times as long as segment 4 at anterior margin.

Pronotum evenly, but weakly convex, with strongly curved lateral margins, which much more convergent anteriad than posteriad, 2.7 times as wide as median length, maximum width at posterior two fifth of lateral margin; on disc with similar reticulation as on posterior half of head, most meshes with small central fovea, shining, along hind and lateral margins surface more rugulose, weakly shining; mesoscutellum 1.9 times as wide as long, rugulose, matt; hemelytron nearly reaching end of abdomen; sutures of embolium and clavus weakly indicated, the latter often absent; clavus, corium, and embolium rugulose, matt, membrane coriaceous, weakly shining; posterior corners of connexiva 3 - 4 weakly acute, of connexivum 5 strongly acute; tergite 5 in middle of posterior margin broadly convex.

Profemur largely expanded, maximum width 0.8 times maximum length; protibia evenly curved, protarsus distinctly separated from protibia, claw reduced, minute, toothlike; mesotibia ventro-medially with double row of numerous short, stout spines, dorsomedially with single row of long spines; metatibia medially in distal three fourths with row of 9 appressed long spines; claws of hind leg 0.6 times as long as segment 3 of metatarsus.

Mesosternum with anteriorly deeply notched, blunt median carina; pregenital abdomen weakly asymmetrical; genital capsule posteriorly angulate; sternites 3 - 6 with numerous erect, relatively long bristles; aedeagus long and slender (Fig. 6); left paramere distally with one elongate lobe separated by deep angular incision from reduced second lobe (Fig. 7); right paramere stout, with broad, roundish apex (Fig. 8).

Brachypterous female: body size: length 6.5 - 6.7 mm; maximum width (at embolar margin or abdominal segment 4): 3.8 - 4.0 mm; pronotal width: 3.4 - 3.55 mm; most characteristics as in male; hind margin of tergite 5 broadly and weakly concave; tergite 7 with deep rectangular emargination, with angular hind corners; apices of laterosternites 5 - 6 spinelike; left laterosternite 5 straight or very weakly curved dorsad, right one nearly straight; laterosternites 6 subsymmetrical, curved ventrad (Figs. 14, 15); subgenital plate with length about 0.8 times basal width, with sides in distal half subparallel, with posterior corners acute, with posterior margin slightly concave (sometimes irregularly), with apical width ca. 0.5 times basal width (Fig. 12).

Macropterous morph: unknown.

Comparative notes: This and the following species are of some phylogenetic interest, because they have long erect hairs on the abdominal sternites, a characteristic so far not described in species of *Stalocoris*, but typical for *Naucoris*. This fact supports the hypothesis about the origin of *Stalocoris* from *Naucoris*-like ancestors in the Philippines (see discussion in ZETTEL & al. 1999) and its position within the Naucorini (see ZETTEL 2001). Except in this characteristic, *S. bicolanus* sp.n. can be identified from other species of the genus by the structure of the female subgenital plate and by details of the male genitalia. The female subgenital plate is similar to that of *S. schoedli* ZETTEL, NIESER & POLHEMUS, 1999 from Negros, but slightly shorter, with sides distally less converging and with the hind margin more deeply concave. *Stalocoris schoedli* is a comparatively large species with clear yellow marks on the hemelytra.

Distribution: Luzon: Sorsogon.

Etymology: This species is named after its occurrence in the Bicol Region, which administratively consists of five provinces in the south of Luzon and in adjacent islands, and zoogeographically is isolated from central Luzon.

Stalocoris bicolanus ruizi ssp.n.

Holotype (brachypterous male): "Philippines: Camarines\ Sur, Ragay, Tanawan,\ Banga, Malinaw River,\ Jan. 12, 2002, leg.\ R.B. Ruiz & A.B. Del Rosario" (UPLB); **paratypes:** 41 ♂♂, 34 ♀♀ (brachypterous), same label data (CSSAC, UPLB, CZW, NHMW).

Description and comparative notes: Similar with the nominotypical subspecies in most characteristics, except the following: size constantly smaller: body length in males 5.6 - 5.9 mm, in females 5.6 - 6.0 mm; maximum body width (at embolar margin or abdominal segment 4) in males 3.3 - 3.5 mm, in females 3.35 - 3.75 mm; pronotal width in males 3.0 - 3.15 mm, in females 3.0 - 3.25 mm; pronotum along lateral margin brownly infuscated in most specimens; yellow marks on corium, especially triangular distal mark, larger; body more slender, especially pronotum narrower, in male ca. 2.6 times as wide

as its median length; left paramere with slightly more shallow emargination; right paramere with apex distinctly bent; subgenital plate of female with sides in distal half slightly more converging.

Although a wide range of size is known in some Naucoridae, e.g. in *Asthenocoris luzonensis*, it is unknown from any species of *Stalocoris*. There is no reason why the small, stable differences in the genitalia of males and females should be correlated with the size of the specimens. This fact justifies the treatment of this population as a geographically isolated subspecies.

Distribution: Luzon: Camarines Sur.

Etymology: Dedicated to Prof. Raul B. Ruiz (Camarines Sur State Agricultural College) to honour his efforts in forming a team of entomologists studying water bugs in the Bicol Region.

Stalocoris rarosae **sp.n.** (Figs. 9 - 11, 13, 16, 17)

Stalocoris sp.: ZETTEL & al. 1999: 79.

Holotype (brachypterous male): "Philippinen: Leyte\ Hilusig, rivers\ 14.2.2000\ leg. H. Zettel (238)" (UPLB); **paratypes:** 5 ♂♂, 6 ♀♀ (brachypterous), same label data (NHMW, UPLB); 1 ♂ (brachypterous) "Hilusig River\ Leyte\ 3-6-2001\ J. Bongo" (USCC); 1 ♂, 1 ♀ (brachypterous) "Hilusig River\ Mahaplag, Leyte\ 03/06/2001\ De los Santos, F." (NHMW, USCC); 3 ♂♂, 7 ♀♀ (brachypterous) "Philippinen: Leyte\ N Tacloban, Babatngon\ Busay Falls, 28.1.2000\ leg. H. Zettel (220)" (NHMW, UPLB); 1 ♀ (brachypterous) "Philippinen: Leyte,\ rivers at Hilusig,\ 6.3.2001\ leg. H. Zettel (295)" (NHMW); 1 ♂ (brachypterous), 1 ♂ (macropterous) "PHILIPPINES\ Baybay, Leyte\ alt. Pangasugan\ Bato Cruz, 380 m.\ 22.V.1984 LAC Raros" (JTPC); 1 ♀ (brachypterous) "PHILIPPINES\ Mt. Pangasugan\ Baybay, Leyte\ 17-III-1987\ A M Almoroda" (ViSCA).

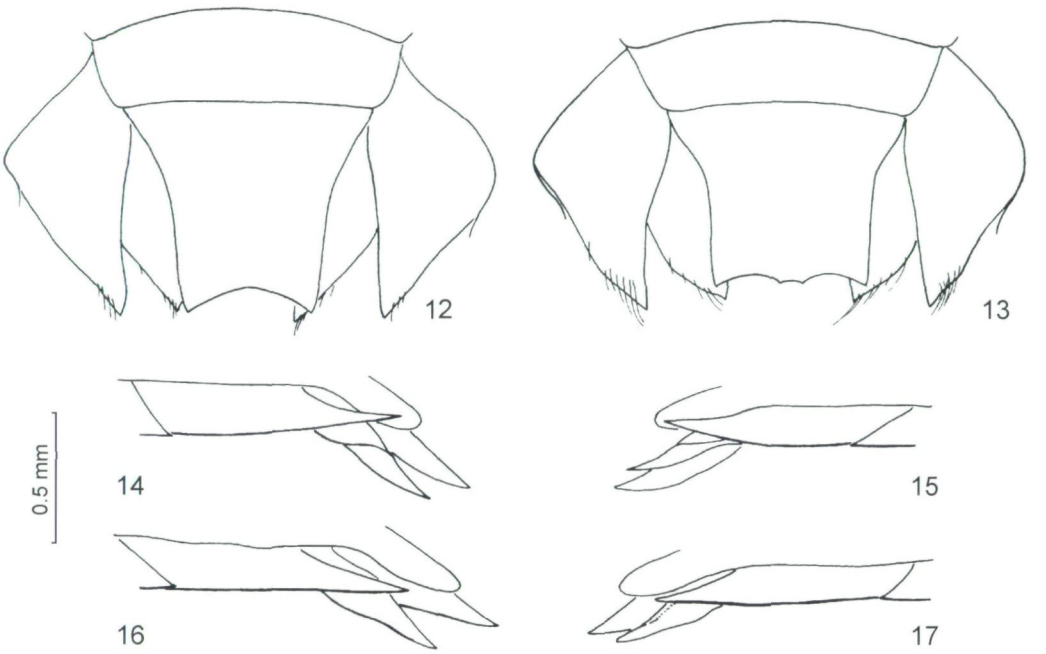
Description:

Brachypterous male: size: body length 5.3 - 5.9 mm; maximum body width (at embolar margin or abdominal segment 4): 3.15 - 3.4 mm; pronotal width: 2.95 - 3.15 mm.

Colour: head and pronotum yellow, head posteriorly at most very inconspicuously darkened, in some specimens anterior and posterior margins of pronotum infuscated; mesoscutellum blackish; hemelytron dark brown or blackish, hemelytron with yellow marks on anterior third of embolium and apex of clavus, often clavus generally lighter brownish; corium with distal margin more or less light brown, only in few specimens with narrow yellowish patch meeting distal margin; abdomen dorsally infuscated, with yellow connexiva; ventral surface yellowish, of metathorax and abdomen more or less infuscated; labrum, rostrum, antenna, and legs yellow.

Structural characteristics: head dorsally reticulate, with relatively small meshes, weakly shining; head width across eyes 1.7 - 1.8 times head length, head in front of eyes 0.12 times head length; synthlipsis 0.7 times head width across eyes; labrum inserted close to anterior margin of head, at anterior margin of rostral cavity, twice as wide as long; ventral extension of maxillary plate anteriorly subequal to half length of labrum; rostral cavity semi-circular, anteriorly weakly convex; rostrum short, segment 3 about 1.1 times longer than segment 4 at anterior margin.

Pronotum evenly, but weakly convex, with strongly curved lateral margins, these more convergent anteriad than posteriad, 2.8 times as wide as median length, maximum width



Figs. 12 - 17: *Stalocoris*: female abdominal segments 6 and 7, in ventral view, of (12) *S. bicolanus bicolanus* sp.n. and (13) *S. rarosae* sp.n.; (14) left and (15) right laterosternites 5 - 7, in lateral view, of brachypterous female of *S. bicolanus bicolanus* sp.n.; (16, 17) same, of *S. rarosae* sp.n. (pilosity omitted).

at posterior third of lateral margin; disc with more pronounced reticulation than on posterior half of head, most meshes with central fovea, shining, along hind margin surface rather punctate, and along lateral margins surface more rugulose, weakly shining; mesoscutellum 2.0 times as wide as long, rugulose, matt; hemelytron nearly reaching end of abdomen; sutures of embolium and clavus weakly indicated, the latter often absent; clavus, corium, and embolium rugulose, matt, membrane coriaceous, weakly shining; posterior corners of connexiva 3 - 4 weakly acute, of connexivum 5 strongly acute; tergite 5 in middle of posterior margin broadly convex.

Profemur largely expanded, maximum width 0.8 times maximum length; protibia evenly curved, protarsus distinctly separated from protibia, claw reduced, minute and toothlike, or indistinct; mesotibia ventro-internally with double row of numerous short, stout spines, dorso-internal with single row of long spines; metatibia internally in distal three fourths with row of 8 appressed long spines; claws of hind leg 0.5 times as long as segment 3 of metatarsus.

Mesosternum with anteriorly deeply notched, blunt median carina; pregenital abdomen weakly asymmetrical; sternites 3 - 6 with numerous erect, relatively long bristles; genital capsule posteriorly angulate; aedeagus long and slender (Fig. 9); left paramere distally with one elongate, rather straight lobe separated by a deep incision from reduced, truncate second lobe (Fig. 10); right paramere stout, with broad, roundish apex (Fig. 11).

Brachypterous female: body size: length 5.9 - 6.1 mm; maximum width (at embolar margin or abdominal segment 4): 3.35 - 3.5 mm; pronotal width: 3.1 - 3.2 mm; most characters as in male; hind margin of tergite 5 broadly and weakly concave; tergite 7 with deep rectangular emargination, with angular hind corners; apices of laterosternites 5 - 6 spinelike, subsymmetrical; laterosternites 5 straight; laterosternites 6 curved ventrad, left one slightly more than right one (Figs. 16, 17); subgenital plate with length about 0.8 times basal width, with sides in distal half parallel, with posterior corners acute, its posterior margin very characteristic, concave and with two small blunt teeth close to midline, apical width ca. 0.6 times basal width (Fig. 13).

Macropterous male: length 6.2 mm; maximum width (at embolar margin or abdominal segment 4): 3.7 mm; pronotal width: 3.3 mm; most characters as in brachypterous male except following:

Pronotum with swelling close to posterior corners, lateral margins at hind corners slightly emarginate; mesoscutellum slightly, larger, medially somewhat shining; hemelytron not distinctly longer than in brachypterous morph, with well developed claval and embolar suture, embolium slightly expanded.

Macropterous female: unknown.

Comparative notes: Although ZETTEL & al. (1999) suspected that the two males, which were available at that time, belong to an undescribed species, they refrained to describe them without knowledge on the female, which in *Stalocoris* has more distinct characteristics than the male. Now females are available and they are most easily distinguishable from all congenerics by the two small, but distinct, medial denticles at the hind margin of the subgenital plate (Fig. 13). *Stalocoris rarosae* sp.n. is most closely related with *S. breviceps* LA RIVERS, 1969 from Mindanao. Males of these two species are weakly differenciated in the apex of the left paramere which is more curved in *S. breviceps*. Like in *S. bicolanus* sp.n., the abdominal sternites of *S. rarosae* sp.n. bear some long erect hairs. *Stalocoris rarosae* sp.n. is smaller than this species and usually lacks a distinct yellowish mark on the distal margin of the corium.

Distribution: Leyte (Leyte).

Etymology: Named after Prof. Dr. L.A.C. Raros (University of the Philippines, Los Baños), entomologist and renowned specialist for Acari, who has discovered this species first in 1984.

Asthenocoris luzonensis luzonensis USINGER, 1938

Asthenocoris luzonensis USINGER, 1938: 303.
Asthenocoris luzonensis luzonensis: ZETTEL & al. 1999: 85.

Additional material examined: 6 ♂♂, 5 ♀♀ (brachypterous) "Philippinen: Sorsogon\ Guinlajon W Sorsogon\ City, 23.1.2000\ leg. H. Zettel (215)" (NHMW, UPLB); 3 ♂♂, 3 ♀♀ (brachypterous) "Philippinen: LZ, Cama-/ rines Sur, Lupi, Alanao/ Bahi River [border with Camarines Norte], 10.2.2002/ leg. H. Zettel (307)" (CZW, UPLB); 4 ♂♂ (brachypterous) "Philippinen: Luzon, Cama-/ rines Sur, Pili, Buncao,/ Caririga Creek, 1.2.2002/ leg. H. Zettel (301)" (CZW, UPLB); 2 ♀♀ (brachypterous) "Philippinen: Luzon, Cama-/ rines Sur, Pili, Buncao,/ Himaao Creek, 1.2.2002/ leg. H. Zettel (302)" (CZW, UPLB); numerous ♂♂ and ♀♀ (brachypterous), 1 ♀ (macropterous) "Philippinen: N. Samar\ Veriato, El Amigo\ Veriato Falls, 25.1.2000\ leg. H. Zettel (217)" (NHMW, UPLB).

Distribution of subspecies: Luzon (La Union, Benguet, Nueva Ecija, Pangasinan, Zambales, Bataan, Rizal, Cavite, Laguna, Quezon, Camarines Sur, Albay), Catanduanes, Samar (Northern Samar) (ZETTEL & al. 1999); first records for Camarines Norte and Sorsogon provinces in Luzon.

Asthenocoris luzonensis leyticus ZETTEL & NIESER, 1999

Asthenocoris luzonensis leyticus ZETTEL & NIESER, 1999 (in ZETTEL & al. 1999): 90.

Additional material examined: 1 ♂ (brachypterous) "93-59 Philippines: Leyte, Hilusig creek, 1.3 km north of Mahaplag junction on road from\ Baybay to Tacloban; east slope; hill creek; 9 July 1993. Coll. M. Kottelat." (ZRCS); 2 ♂♂, 2 ♀♀ (brachypterous) "Philippinen: Leyte\ Hilusig, rivers\ 14.2.2000\ leg. H. Zettel (238)" (NHMW); 6 ♂♂, 3 ♀♀ (brachypterous) "Philippinen: Leyte\ Makinhas, river\ 15.2.2000\ leg. H. Zettel (239)" (NHMW, UPLB).

Distribution of subspecies: Leyte.

Asthenocoris medius medius ZETTEL, NIESER & POLHEMUS, 1999

Asthenocoris medius medius ZETTEL, NIESER & POLHEMUS, 1999: 94.

Additional material examined: 4 ♂♂, 1 ♀ (brachypterous) "93-59 Philippines: Leyte, Hilusig creek, 1.3 km north of Mahaplag junction on road from\ Baybay to Tacloban; east slope; hill creek; 9 July 1993. Coll. M. Kottelat." (ZRCS); numerous ♂♂ and ♀♀ (mostly brachypterous) "Philippinen: Leyte\ Hilusig, rivers\ 14.2.2000\ leg. H. Zettel (238)" (NHMW, UPLB, ZIAS); numerous ♂♂ and ♀♀ (mostly brachypterous) "Philippinen: Leyte\ Makinhas, river\ 15.2.2000\ leg. H. Zettel (239)" (NHMW, UPLB).

Distribution of subspecies: Leyte.

Asthenocoris medius samarensis ZETTEL & NIESER, 1999

Asthenocoris medius samarensis ZETTEL & NIESER, 1999 (in ZETTEL & al. 1999): 94.

Additional material examined: 1 ♀ (brachypterous) "Philippinen: N. Samar\ Veriato, El Amigo\ Veriato Falls, 25.1.2000\ leg. H. Zettel (217)" (NHMW).

Correction: Due to a typing mistake, two institutions "(UPLB) (USNM)" have been stated to be the repository of the holotype. The holotype is deposited in UPLB.

Distribution of subspecies: Samar.

Asthenocoris australis ZETTEL, NIESER & POLHEMUS, 1999

Asthenocoris australis ZETTEL, NIESER & POLHEMUS, 1999: 97.

Additional material examined: numerous ♂♂ and ♀♀ (brachypterous), 1 ♀ (macropterous) "Philippinen: Mindanao\ Surigao d.N., Matinao Riv.\ E Mainit, 8.2.2000\ leg. H. Zettel (232)" (NHMW, UPLB, ZIAS); 1 ♂ (macropterous) "Philippinen: Mindanao\ Surigao d.N., Bacuag\ Campo, 9.2.2000\ leg. H. Zettel (233)" (NHMW).

Distribution: Mindanao (Zamboanga del Sur, Bukidnon, Agusan Norte, Davao, South Cotabato, Sarangani), Camiguin (ZETTEL & al. 1999); first records from Surigao del Norte.

Family Notonectidae

Notes: In the Philippines, the family is represented by four genera, seventeen species and one subspecies (NIESER & CHEN 1999, NIESER & ZETTEL 1999). One species is added in this paper. Specimens are macropterous, if not otherwise stated. A key to the genera and to the Philippine species of *Enithares* has been provided by NIESER & ZETTEL (1999). A key to the males of the Philippine species of *Anisops* is added in this paper. The user of the key should bear in mind, that there is still some unrevised material of *Anisops* spp., which has not been included in this study.

Enithares nieseri sp.n. (Figs. 19 - 23)

Holotype (male): "Philippinen: Mindanao\ Surigao d.N., SW Bacuag\ Payapag, "Little Baguio"\ Waterfalls, 6.2.2000\ leg. H. Zettel (228) (UPLB); **paratype**: 1 ♂, same label data (NHMW).

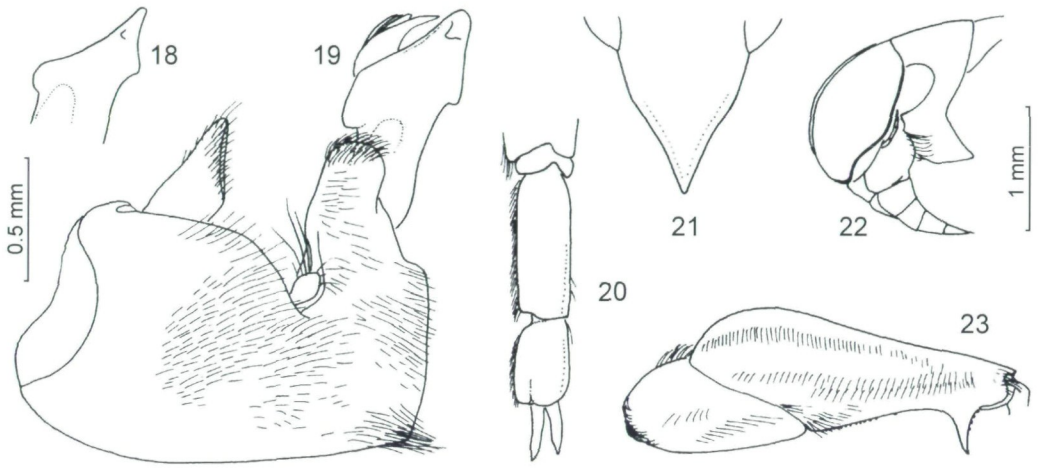
Description of male: Size (holotype is smaller specimen): body length 9.9 - 10.3 mm; body width (just anterior of apex of scutellum) 3.7 - 3.9 mm; humeral width of pronotum 3.6 - 3.8 mm; width of head 3.2 - 3.35 mm.

Colour: dorsal aspect pale yellow, but eyes castaneous with blackish mottling and apical part of membrane infuscated; ventral aspect predominately pale, but labrum, rostrum, sides of pronotum, embolium, coxal plates, and sternites weakly infuscated; legs yellowish, trochanters and femora with dark brown stripes.

Structural characteristics: anterior margin of head transverse, with vertex hardly protruding; head width 2.5 times median length in dorsal aspect, 3.1 times anterior width of vertex; median head length subequal to median length of pronotum; anterior width of vertex about 1.8 times synthlipsis; humeral width of pronotum 2.9 times pronotal length; humeral angles rounded; lateral margins of pronotum slightly diverging posteriad, hind margin gently sinuate; dorsal margin of pronotal fovea pointing directly caudad; lateral margin of pronotal fovea pointing straight at angle of posterior eye margin, with anterior end forming blunt corner (Fig. 22); embolium anteriorly weakly expanded; nodal furrow curved cephalad, distance from membranal suture much less than its length; metaxiphus with acute apex, with sides more convergent subapically than basally (Fig. 21); protrochanter without ventral nodule; protibia and protarsus distinctly flattened; second protarsomere 2.7 times, third protarsomere 1.6 times longer than wide (Fig. 20); mesotrochanter roundly angulate; ventral pilosity of mesofemur separated in dorsal and ventral band, the latter more developed (Fig. 23); mesotibia and mesotarsus distinctly flattened; connexiva of segments 1 - 2 with areas densely covered by small black spines, without ridges; genital capsule as in Figure 19, lateral arms of basal plate apically with pair of laterad pointing hooks.

Female: unknown.

Notes: *Enithares nieseri* sp.n. is closely related with *E. gantsophora* NIESER & ZETTEL, 1999 and *E. foveata* LANSBURY, 1968. These three species form a species group, which is restricted to an area covered by the large Pleistocene island "Greater Mindanao", and it seems likely that they have an allopatric distribution, but present records are too scarce. The species group is defined by characteristics of the pronotum and of the genitalia of



Figs. 18 - 23: (18) *Enithares foveata*: lateral arms of the basal plate of the aedeagus; (19 - 23) *Enithares nieseri* sp.n.: (19) genital capsule; (20) protarsus, dorsal view; (21) metaxiphus, ventral view; (22) head and pronotum, lateral view; (23) mesofemur and mesotrochanter, ventral view.

the male: The lateral margin of the pronotal fovea is produced towards the eye and forms a nodule or tooth (Fig. 22). The lateral arms of the basal plate of the male form a distinct tooth at the posterior margin and bear small, laterad directed structures subapically. These are toothlike in *E. gantsophora* and *E. nieseri* (Fig. 19), but minute, sometimes hardly recognizable denticles in *E. foveata* (Fig. 18). Further, all the three species agree in relatively stout build and in a predominating yellow morph (only in *E. foveata* about one fourth of the examined specimens has dark colouration). *Enithares gantsophora* differs from the other two species, e.g., in the distinctly larger size (11.3 - 12.1 mm), the very broad build, and the broadly rounded apex of the paramere. *Enithares nieseri* sp.n. and *E. foveata* appear more similar to each other, but in addition to the different structure of the lateral arm (comp. Figs. 18 and 19), in *E. nieseri* sp.n. the protibia and the protarsus are more flattened, the medial punctured field of the mesoscutellum is much broader, and the punctures on the clavus are much denser than in *E. foveata*. Further, *E. nieseri* sp.n. differs from both *E. gantsophora* and *E. foveata* in the less sharply developed anterior projection of the lateral margin of the pronotal fovea.

Distribution: Mindanao: Surigao del Norte.

Enithares bakeri BROOKS, 1948

Enithares bakeri BROOKS, 1948: 40; NIESER & ZETTEL 1999: 129.

Additional material examined: 2 ♂♂, 4 ♀♀ "Philippinen: Camotes Isl.,\ Poro Isl., Poro, Rizal,\ channel, 26.2.2001\ leg. H. Zettel (280a)" (NHMW, UPLB).

Distribution: Probably all over the Philippine Islands and recorded from Mindoro, Marinduque, Negros, Siquijor, Biliran, and Mindanao (NIESER & ZETTEL 1999); first record from the Camotes group (Poro Island); outside the Philippines also recorded from Indonesia and Malaysia.

Enithares foveata LANSBURY, 1968 (Fig. 18)

Enithares foveatus LANSBURY, 1968: 429.
Enithares foveata: NIESER & ZETTEL 1999: 130.

Additional material examined: 2 ♂♂, 2 ♀♀ "Philippinen: N. Samar\ Veriato, El Amigo\ Veriato Falls, 25.1.2000\ leg. H. Zettel (217)" (NHMW, UPLB); 3 ♂♂, 5 ♀♀ "Philippinen: Leyte\ N Tacloban, Babatngon\ Busay Falls, 28.1.2000\ leg. H. Zettel (220)" (NHMW, UPLB); 1 ♂, 1 ♀ "Philippinen: Leyte\ Baybay, ViSCA, creeks\ 250m, 1.2.2000\ leg. H. Zettel (222c)" (NHMW, UPLB).

Morphological notes: The lateral arms of the basal plate (Fig. 18) bear minute denticles subapically, which have been overlooked by previous authors (LANSBURY 1968, NIESER & ZETTEL 1999). See also Notes under *E. nieseri* sp.n.

Distributional notes: *Enithares foveata* has been described from Leyte ("Tigbao") (LANSBURY 1968) and later-on been recorded from Biliran and Samar (NIESER & ZETTEL 1999). The above mentioned specimens are the first records from Leyte since the original description.

Enithares freyi BROOKS, 1948

Enithares freyi BROOKS, 1948: 48; NIESER & ZETTEL 1999: 130.

Additional material examined: 1 ♂ "Philippines, Luzon, Lagunas [sic!]\ Mt. Banahaw above Kinabu-\ hayan, 800 m, creek in degra-\ ded rainforest, 25. XI. 1995\ J. Kodada & B. Rigová lgt." (NHMW).

Distributional notes: *Enithares freyi* is a very rare species so far only recorded in a few specimens from high elevations in North Luzon (Mountain Province, Benguet) (NIESER & ZETTEL 1999). This is the first record from Laguna Province and from central Luzon, which is a substantial extension of the known distribution of this species and suggests that it may be found also in other mountain areas in Luzon.

Enithares martini martini KIRKALDY, 1898

Enithares martini KIRKALDY, 1898: 151.
Enithares martini: LANSBURY 1968: 432.
Enithares martini martini: NIESER & ZETTEL 1999: 131.

Additional material examined: 1 ♂, 1 ♀ "Philippinen: N. Samar\ Veriato, El Amigo\ Veriato Falls, 25.1.2000\ leg. H. Zettel (217)" (NHMW, UPLB); 1 ♂, 1 ♀ "Philippinen: Leyte\ N Tacloban, Babatngon\ Busay Falls, 28.1.2000\ leg. H. Zettel (220)" (NHMW, UPLB); 1 ♂, 1 ♀ "Philippinen: Leyte\ Baybay, ViSCA, 50m,\ Lago-Lago Riv., 31.1.\ 2000,lg.H.Zettel (222b)" (NHMW, UPLB); 1 ♂ "Philippinen: Leyte\ Hilusig, rivers\ 14.2.2000\ leg. H. Zettel (238)" (NHMW); 1 ♂ "Philippinen: Leyte,\ rivers at Hilusig,\ 6.3.2001\ leg. H. Zettel (295)" (NHMW); 3 ♂♂, 3 ♀♀ "Philippinen: Mindanao\ Surigao d.N., SW Bacuag\ Payapag, "Little Baguio"\ Waterfalls, 6.2.2000\ leg. H. Zettel (228)" (NHMW, UPLB).

Distributional notes: Probably *E. martini martini* occurs throughout the Philippine Islands except in the Palawan Region and in Mindoro, and has been recorded from numerous islands (NIESER & ZETTEL 1999). The above mentioned material, however, includes the first records from Leyte and from Surigao del Norte Province in Mindanao.

Enithares quadrispinosa LANSBURY, 1967

Enithares freyi quadrispinosus LANSBURY, 1967: 94-96.
Enithares quadrispinosa: NIESER & ZETTEL, 1999: 132.

Additional material examined: 1 ♀ "Philippines, Palawan centr.\ Sabang env. 30. XI. 1995,\ 100 m, stream in degraded\ forest, J. Kodada lgt." (NHMW).

Distribution: endemic in Palawan Island.

Aphelonecta philippina ZETTEL, 1995

Aphelonecta philippina ZETTEL, 1995: 109; ZETTEL & al. 1998: 63.

Distributional notes: This rare species has been described from Palawan (ZETTEL 1995) and recently has been discovered in Sabah, North Borneo (ZETTEL & al. 1998).

Nychia cf. *sappho* KIRKALDY, 1901

Nychia marshalli var. *sappho* KIRKALDY, 1901: 809.
Nychia sappho: LANSBURY 1985: 4; NIESER & CHEN 1991: 64; NIESER & CHEN 1999: 121, 122.
Nychia malayana LUNDBLAD, 1933: 148.

Material examined (all brachypterous): 5 ♀♀ "Philippinen: Masbate Isl.\ 3.5 km SE Masbate, Tugbo\ Tugbo River, 2.3.1998\ leg. H. Zettel (152)" (NHMW, UPLB); 1 ♂, 1 ♀ "PHILIPPINEN: Romblon Prov.\ Sibuyan,E Magdiwang\ Tampayan, 17.11.1994\ leg. H. Zettel (66c)" (CZW); 11 ♂♂, 2 ♀♀ "Philippinen: Leyte\ E Ormoc, Lake Danao\ 13.2.2000\ leg. H. Zettel (237)" (NHMW, UPLB); 1 ♀ "93-56 Philippines: Samar: Sohoton Cave area; Basey River, ca. 20 km upriver from Basey; permanent freshwater, but ca. 1,4 m tidal amplitude; 6 July 1993. Coll. M. Kottelat" (ZRCS).

Notes: *Nychia sappho* is presently regarded as a variable species, which is widely distributed from continental Southeast Asia to Australia (LANSBURY 1985, NIESER & CHEN 1991, 1999). The Indochinese and Malesian material of *Nychia* shows considerable variation, as already described by LUNDBLAD (1933; under *N. malayana* LUNDBLAD, 1933) for the first time. The taxonomic status of the various populations is not well understood. Philippine material expresses not only variations in external characteristics (size, colour), but also in the shape of the parameres of the males. The author does not feel experienced enough to comment on these enigmatic attributes of *Nychia*. Specimens collected in Sibuyan have been identified as *N. sappho* by Dr. Nico Nieser (Tiel).

Distribution: from Southeast Asia to Australia. Philippines: first records from Sibuyan, Masbate, Western Samar, and Leyte.

Anisops kuroiwae MATSUMURA, 1915

Anisops kuroiwae MATSUMURA, 1915: 109; YANO & al. 1981: 24; NIESER & CHEN 1999: 111, 122.
Anisops batillifrons LUNDBLAD, 1933: 463; BROOKS 1951: 420; NIESER & CHEN 1991: 57.

Material examined: numerous ♂♂ and ♀♀ from the following three localities: "Philippinen: Mindoro or.\ Puerto Galera, Sabang\ 19.11. - 1.12.1992\ leg. H. Zettel", "Small La Laguna (10)\ flache Tümpel [shallow ponds], 1.12."; same label data except "... (9) ... 22.11."; "Philippinen: Mindoro or.\ Baco, SW Calapan\ Tümpel [pond], 20.11.1992\ leg. H.Zettel (15)" (NHMW, UPLB, NCTN); 1 ♂ "Philippinen: Mindoro or.\ Baco, Tümpel b. [ponds along]\ Alag River, 28.11.1993\ leg. H. Zettel (34a)" (NHMW); 1 ♂ "PHILIPPINEN: Negros\ SE Bacolod,Mambucal\ Health Resort,15.3.\ 900m,lg.Zettel 1994 (39b)" (NHMW); 1 ♀ "PHILIPPINEN:Panay,Antique\ 50km NE San Jose d.B.\ San Remigio,Napula Falls\ lg.Zettel,20.3.1994 (43)" (NHMW); 2 ♂♂ "PHILIPPINEN:Panay,Ilo-Ilo\ 10km NE Igbaras,Nadsadan\ Falls, 500m, 22.3.1994\ leg. H. Zettel (47)" (NHMW, UPLB); 1 ♀ "Philippinen: Catanduanes\ N Bato, S San Miguel\ Balongbong

Falls, 7.3.\ 1999, leg. H. Zettel (195)" (NHMW); 1 ♂ "Philippinen: N. Samar\ Veriato, El Amigo\ Veriato Falls, 25.1.2000\ leg. H. Zettel (217)" (NHMW); 1 ♀ "Philippinen: Leyte\ Hilusig, rivers\ 14.2.2000\ leg. H. Zettel (238)" (NHMW); 1 ♀ "PHILIPPINEN: Palawan\ 10 km S Brooke's Point\ Caingaren river, 1.4.\ leg.H.Zettel 1994 (56)" (NHMW).

Distribution: common and widely distributed from India through Southeast Asia to Hainan, Taiwan, Iriomote, and the Philippines (NIESER & CHEN 1999); Philippines: Luzon (Laguna), Mindanao (Surigao del Sur) (YANO & al. 1981); first records from Mindoro (Oriental M.), Panay, Negros, Catanduanes, Samar, Leyte, and Palawan.

Anisops nasutus FIEBER, 1851

Anisops nasuta FIEBER, 1851: 60; BROOKS 1951: 416.
Anisops nasutus: NIESER & CHEN 1999: 110.

Distribution: widely distributed from India to Australia; according to NIESER & CHEN (1999) also occuring in the Philippines (without further information on locality).

Anisops nigrolineatus LUNDBLAD, 1933

Anisops nigrolineata LUNDBLAD, 1933: 160; BROOKS 1951: 409.
Anisops nigrolineatus: NIESER & CHEN 1999: 122.

Distribution: widely distributed from India to the Philippines, from there with a single record from Sibuyan island (NIESER & CHEN 1999).

Anisops nodulatus BROOKS, 1951

Anisops nodulata BROOKS, 1951: 336; YANO & al. 1981: 24.

Distribution: Philippines, New Guinea, and Australia; all records from the Philippines from Luzon: Ifugao (YANO & al. 1981), Benguet, and Pangasinan (type locality) (BROOKS 1951).

Anisops philippinensis BROOKS, 1951

Anisops philippinensis BROOKS, 1951: 383; NIESER & CHEN 1999: 121, 122.

Distributional notes: Probably this species is endemic in the Philippines, where it has been recorded from Mindanao (type locality in Davao) and Luzon; Australian records probably refer to other species (NIESER & CHEN 1999).

Anisops rhomboides NIESER & CHEN, 1999

Anisops tahitiensis (nec *A. tahitiensis* LUNDBLAD, 1933): LANSBURY 1967: 97; NIESER & ZETTEL 1999: 123.
Anisops rhomboides NIESER & CHEN, 1999: 111.

Material examined: 20 ♂♂, 9 ♀♀ "PHILIPPINEN: Palawan\ Brooke's Point\ Mate, 31.3.1994\ leg. H. Zettel (54)" (NHMW, UPLB).

Notes: Specimens from the Philippines formerly referred to *Anisops tahitiensis* LUNDBLAD, 1933 belong to this species (NIESER & CHEN 1999).

Distribution: Borneo, Sulawesi; Philippines: Mindanao (South Cotabato) (NIESER & CHEN 1999), Tawi Tawi (LANSBURY 1967, sub *A. tahitiensis*); first record from Palawan.

Anisops stali KIRKALDY, 1904

Anisops stali KIRKALDY, 1904: 113, 132; BROOKS 1951: 319; NIESER & CHEN 1999: 111.

Material examined: 16 ♂♂, 12 ♀♀ "Philippinen: Mindoro or.\ Puerto Galera, Sabang\ 19.11. - 1.12.1992\ leg. H. Zettel", "Small La Laguna (10)\ flache Tümpel [shallow ponds], 1.12." (NHMW, UPLB); 1 ♀ "Philippinen: Mindoro or.\ Puerto Galera, S Big\ La Laguna,25.11.1993\ leg. H. Zettel (33)" (NHMW).

Distributional notes: BROOKS (1951) presented records from Australia, Indonesia, Japan, and the Philippines; NIESER & CHEN (1999) mentioned this species for Southeast China and Taiwan. Philippines: Mindanao (BROOKS 1951); first records from Mindoro (Oriental M.).

Anisops yanoi MIYAMOTO, 1981

Anisops yanoi MIYAMOTO, 1981 (in YANO & al.): 25.

Material examined: 1 ♂ "Philippinen: LZ, Mount.Pr.\ Chico River, Gonogon\ 1100 m, 21.2.1999\ leg. H. Zettel (184)" (CZW).

Distributional notes: *Anisops yanoi* has been described from Ifugao Province in North Luzon and is here recorded from the neighbouring Mountain Province for the first time. Presently it must be regarded as endemic to this region.

Key to the species of *Anisops* recorded from the Philippine Islands (males only)

Notes: Males can be distinguished from females by the presence of stridular teeth or pegs on the protibia and a pair of lateral outgrows on the third rostral segment (rostral prongs).

1	Large species, body length 9.0 mm or more.	***A. stali***
-	Small species, body length 7.8 mm or less.	**2**
2	Head with anterior protuberance.	**3**
-	Head without anterior protuberance.	**5**
3	Claws of middle leg of similar shape; in dorsal view anterior margin of cephalic protuberance wide and concave.	***A. nasutus***
-	Claws of middle leg of very different shape; in dorsal view anterior margin of cephalic protuberance narrow and straight.	**4**
4	Labrum basolaterally with pair of long hairs; frons entirely grooved.	***A. yanoi***
-	Labrum without pair of long hairs; frons incompletely grooved.	***A. kuroiwae***
5	Along midline head length less than half of pronotal length.	***A. nigrolineatus***
-	Along midline head length at least half of pronotal length.	**6**

6 Width of head approximately ten times anterior width of vertex. ..... ***A. philippinensis***

- Width of head less than seven times anterior width of vertex. **7**

7 Third rostral segment anteriomedially with two nodules; tylus (facial tubercle) flattened, slightly concave. ..... ***A. nodulatus***

- Third rostral segment anteriomedially without nodules; tylus (facial tubercle) compressed and elevated, apically grooved. ..... ***A. rhomboides***

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