A NEW WORLD SPECIES OF *CYMOPHYES* AND A NEW SPECIES OF *XYONYSIUS* FROM THE TURKS AND CAICOS ISLANDS (HEMIPTERA: LYGAEIDAE)

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ABSTRACT

Cymophyes nesocoris **New Species** and *Xyonysius acticola* **New Species** are described from the Turks & Caicos Islands, British West Indies. Species of *Cymophyes* have previously been known to occur only in the Eastern Hemisphere. The immature stages are described and the hosts and habitats discussed.

RESUMEN

Cymophyes nesocoris **Nueva Especie** y *Xyonysius acticola* **Nueva Especie** son descritas de las islas Turks y Caicos, Antillas Británicas. Anteriormente, las especies de *Cymophyes* eran sólo conocidas del Hemispherio Oriental. Son descritos los estados inmaduros y discutidos los hospedantes y habitats.

During the course of our work on the lygaeid fauna of the West Indies two unusual new species have been collected on the Turks and Caicos Islands. The most striking of these is an undescribed species of *Cymophyes* Fieber, a genus which has not been known previously to occur in the Western Hemisphere.

We also recognize a new species of the orsilline genus *Xyonysius* Ashlock & Lattin whose closest relative appears to be an endemic species from the Galapagos Islands.

All measurements are in millimeters.

Cymophyes nesocoris Baranowski and Slater, **New Species**
(Fig. 1)

DESCRIPTION. General coloration stramineous, heavily punctate. Conspicuously differentiated brown to black punctures as follows: on midline of head, antenniferous tubercles, first, second, basal half of third antennal segments, midline and lateral margins of pronotum, a single row on either side of midline of scutellum, a few irregularly spaced on corium, forming a longitudinal vitta through the middle of pro-, meso-, and metapleuron, mesally on meso- and metasternum, all of femora and tibiae dark brown; punctures on rest of body stramineous, concolorous with body surface. Abdominal terga with a pair of dark brown vittae, composed of dark brown punctures, merging mesally on last two segments. Wings not reaching end of abdomen.

Head elongate, strongly tapering anteriorly, apex of tylus slightly exceeding distal end of first antennal segment. Length head 0.70, width 0.60, interocular space 0.38. Pronotum slightly narrowing from posterior to anterior margin, lateral margins very slightly sinuate, anterior margin concave, posterior margin straight. Length pronotum 0.82, width across anterior margin 0.52, width across posterior margin 0.90. Scutellum slightly elevated along midline, but lacking a definite carina. Length scutellum 0.40, width 0.42. Length claval commissure 0.36. Distance along midline from apex clavus to apex corium 0.76. Distance along midline from apex corium to apex wing membrane 1.06. Forefemora strongly incrassate, armed below with a series of major and minor spines with the apices darkened. Labium extending between forecoxae. Length labial segments I 0.29, II 0.29, III 0.14, IV 0.23. Antennae thick, all segments with short hairs, segment IV impunctate, segment I enlarged distally. Length antennal segments I 0.23, II 0.40, III 0.33, IV 0.38. Total body length 4.70.

TYPES. Holotype. ♂ **Turks and Caicos Isl., B.W.I., North Caicos Island:** Horse Stable Beach Rd., 22-X-1993 (on *Sporobolus domingensis*), R. M. & H. V. Baranowski. In U.S. National Museum of Natural History. Paratypes. 133♂, 189♀, same data as holotype; 16♂, 24♀, same except 26-XI-1994; 3♂, 5♀, same except Mudhole Pond; 3♂, 2♀, same except 0.5 mi S. Horse Stable Beach, 26-VI-1993; 108♂, 188♀, same except 27-VI-1993. **Middle Caicos Island:** 21♂, 19♀, Julia Williams Point, 24-X-1993, (on *Sporobolus domingensis*), R. M. & H. V. Baranowski; **Providenciales Island:** 4♂, 7♀, 0.5 mi N. Downtown, 19-X-1993, (on *Sporobolis domingensis*), R. M. & H. V. Baranowski; 124♂, 136♀, Leeward, 19-X-1993 (on *Sporobolis domingensis*), R. M. & H. V. Baranowski; 20♂, 20♀, Leeward Hwy., Pole #A139, 20-X-1995, (on *Sporobolis domingensis*), R. M. & H. V. Baranowski; 132♂, 186♀, 0.5 mi S. Downtown, 20-X-1993, (on *Sporobolis domingensis*), R. M. & H. V. Baranowski; 4♂, 5♀, same except 23-XI-1994. In U.S. National Museum of Natural History, American Museum of Natural History, Natural History Museum (England), Florida State Collection of Arthropods, R. M. Baranowski and J. A. Slater collections.

ETYMOLOGY. Referring to the island distribution.

This species will key to *C. ochroleuca* Fieber in Seidenstucker (1953) (see English translation in Slater 1955), but it is not actually closely related. *Cymophyes ochroleuca* is the most elongate of the species in the nominal subgenus but is considerably less elongate than is *C. nesocoris*. The latter has a body at least five and one-fourth times the maximum width. *C. ochroleuca* has a maximum length/width ratio not greater than four and one-fourth times as long as wide. None of the described species of *Cymophyes* have conspicuous black punctures on the antennal segments. The genus *Stenophyella* does have punctate antennal segments but also has a conspicuously bifid apex on the abdomen which is not the case with the new species described here. *Stenophyella* has been thought to be confined to Australia but we have examined specimens from Thailand, Macao, Vietnam, Papua New Guinea and New Caledonia.

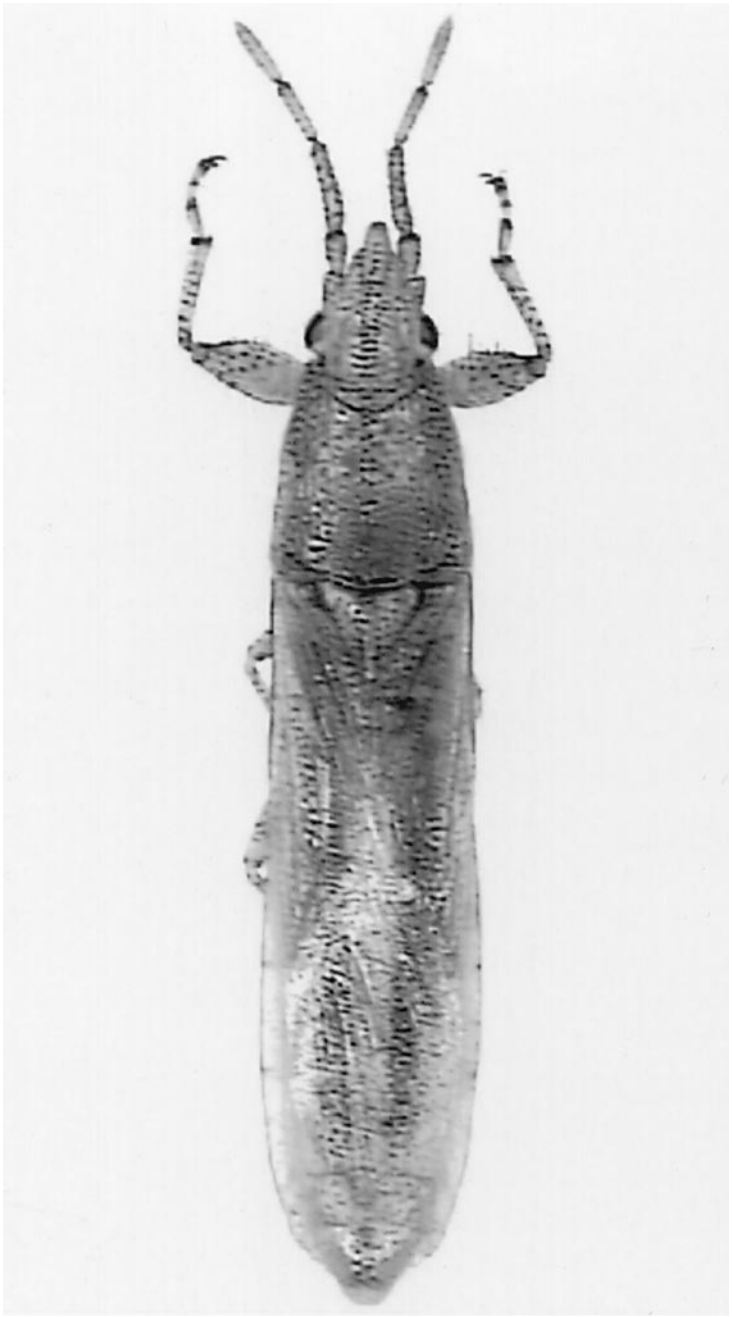

Fig. 1. *Cymophyes nesocoris* Baranowski and Slater, **New Species**, dorsal view.

Lindberg (1958) recognized the similarity of *Cymophyes* and *Stenophyella* when he described an elongate species from the Cape Verde Islands as *Stenophyella africana*. Slater (1966) noted that Lindberg's species lacked a bifid apex on the abdomen and transferred *S. africana* to *Cymophyes*. Linnavuori (1978) erected the subgenus *Afrophyella* in the genus *Cymophyes* for *C. africana* because of its extremely elongate body.

Cymophyes (*Afrophyella*) *africana* is a very elongate species. It is, in fact, much more elongate than is *C. nesocoris*, the length/width ratio being at least 7.5 and sometimes over 8, whereas in *C. nesocoris* the ratio is less than 5.5. It also lacks the black antennal punctures and is an overall very pale species throughout with at most a faint trace of darkened punctures as a faint line along the pleural surfaces. In addition to the type locality Linnavuori (1978) reported *C. africana* from the Sudan, Ethiopia and Pakistan. We have examined Ethiopian and Pakistan specimens and agree that they appear to be conspecific.

We treat *C. nesocoris* in the nominal subgenus *Cymophyes* despite its more elongate body and black antennal puncture.

DISTRIBUTION. *Cymophyes nesocoris* was collected on the islands of Providenciales, Middle Caicos and North Caicos. It was not found on Grand Turk nor on the islands of Andros and Long Island in the Bahamas even though the host plant was present. Subsequent to the completion of this manuscript, Dr. Horatio Grillo of the Universidad Central de Las Villas, Santa Clara, Cuba, brought to the attention of the junior author a question he had first raised as early as 1978 concerning the possibility of an insect similar to *Cymophyes* occurring on Cuba. Dr. Grillo has been kind enough to send pictures of specimens from Cuba and also to allow us to include the information in this paper. His photographs clearly indicate that Cuban material is conspecific with *Cymophyes nesocoris*. Thus, not only is the species also present in the Greater Antilles, but if it is an introduced species, it was established sometime before 1978.

The discovery of a species of this otherwise Eastern Hemisphere genus in the West Indies, more specifically the Bahama Archipelago, raises questions as to whether we are dealing with an introduction or an endemic but previously overlooked taxon. The most probable scenario seems to us to consider *C. nesocoris* to be an introduced species from an as yet unknown place in the Eastern Hemisphere. Much of the West African lygaeid fauna is still poorly known and seems a likely area for investigation. Given the prevailing east to west trade winds at the latitude of the Turks and Caicos Islands, the possibility of the species having reached the islands by aerial transport seems higher than by introduction in commercial or recreational ships or planes. On the other hand it must be recognized that *C. nesocoris* is not really extremely closely related to any of the known species of *Cymophyes* and does have similarities to species of *Stenophyella*. One must thus take into account the former presence of a member of this complex in the past in the Western Hemisphere. Sailer & Carvalho (1957) described a Miocene fossil species from the Mojave desert in California as *Procymophyes lithax*.

Thus we face the fascinating question of whether we are dealing with a previously unknown species from somewhere in the Eastern Hemisphere or a hitherto uncollected vicariant species, native to the Western Hemisphere.

BIOLOGY OF *C. NESOCORIS*

Cymophyes nesocoris was collected only on *Sporobolus domingensis* (Trin.) Kunth. (Poaceae), a common roadside grass in the Greater Antilles, the Bahama Archipelago and south Florida. All stages were found in the seedheads during the periods collected. Eggs are deposited, typically singly, between the seed and sheath. Nymphs and adults were observed feeding on the seeds. Other species of grasses were swept at several sites where *S. domingensis* was present without collecting *C. nesocoris*.

DESCRIPTION OF *C. NESOCORIS* NYMPHS AND EGG

Fifth instar (in alcohol)

Elongate, slender, stramineous in color. Head and body impunctate. Antennae, femora and tibiae with brown punctation. Pro- meso- and metapleuron with a light brown longitudinal vitta. Wing pads, lateral margins of pronotum and midline of scutellum pronotum and head brown. Legs light brown, eyes red. Each abdominal tergite with a pair of small brown spots. Length head 0.68, width 0.63, interocular space 0.43. Length pronotum 0.63, width 0.90. Length wing pads 1.33. Length abdomen 3.0. Length labial segments I 0.28, II 0.24, III 0.16, IV 0.22. Length antennal segments I 0.20, II 0.38, III 0.32, IV 0.38. Total body length 4.50.

Fourth instar (in alcohol)

Shape and color similar to preceding instar. Length head 0.60, width 0.48, interocular space 0.34. Length pronotum 0.40, width 0.34. Length wing pads 0.62. Length abdomen 1.80. Length labial segments I 0.16, II 0.20, III 0.16, IV 0.16. Length antennal segments I 0.14, II 0.26, III 0.22, IV 0.32. Total body length 3.10.

Third instar (in alcohol)

Shape and color similar to preceding instar. Length head 0.40, width 0.42, interocular space 0.30. Length pronotum 0.26, width 0.52. Length wing pads 0.22. Length abdomen 1.40. Length labial segments I 0.16, II 0.24, III 0.12, IV 0.16. Length antennal segments I 0.10, II 0.18, III 0.18, IV 0.28. Total body length 2.36.

Second instar (in alcohol)

Shape and color similar to preceding instar. Length head 0.38, width 0.32, interocular space 0.22. Length pronotum 0.18, width 0.40. Length abdomen 1.0. Length labial segments I 0.12, II 0.16, III 0.10, IV 0.14. Length antennal segments I 0.06, II 0.12, III 0.12, IV 0.24. Total body length 1.70.

First instar (in alcohol)

Shape and color similar to preceding instar. Length head 0.28, width 0.28, interocular space 0.24. Length pronotum 0.12, width 0.30. Length abdomen 0.56. Length labial segments I 0.10, II 0.14, III 0.06, IV 0.14. Length antennal segments I 0.06, II 0.10, III 0.10, IV 0.22. Total Body length 1.10.

Egg (in alcohol)

Elongate, tapering to both ends, operculum flat with 6-10 micropylar projections, opposite end rounded. Length 0.74, width at middle 0.26, operculum 0.10.

Xyonysius acticola Baranowski and Slater **New Species**
(Fig. 2)

DESCRIPTION. General coloration brown to griseus; head brown with a pale midline vitta extending from base anteriorly to approximately middle of eyes, a black

vitta on either side of midline extending anteriorly around ocelli to anterior eye margin; antennal tubercles marked with black laterally; ventral surface of head pale with a short black vitta on either side of labium; pronotum brown, median longitudinal carina of posterior pronotal lobe and humeri pale. Scutellum with a pale vitta extending from apex to midpoint. Hemelytra mottled brown; membrane with faint brownish markings. Upper half of pleuron brown, lower half yellowish, acetabula white. Femora brownish with proximal one-third yellow, tibiae and tarsi yellowish. Distal half of first antennal segment, all of fourth segment brown; proximal half of first, all of second and third yellowish.

Head nondeclivent, impunctate, tylus almost reaching distal end of first antennal segment. Length head 1.0, width 1.0, interocular space 0.60. Pronotum uniformly punctate with a faint medial longitudinal carina; anterior pronotal lobe with a transverse impression interrupted by the median longitudinal carina; lateral margins slightly sinuate, posterior margin slightly concave. Length pronotum 1.0, width 1.6. Scutellum punctate with three raised ridges, one extending from the base to the midpoint, the other two extending from the lateral margins of the base to the midpoint. Length scutellum 0.70, width 0.94. Length claval commissure 0.64. Midline distance apex clavus-apex corium 1.04. Midline distance apex corium-apex membrane 0.96. Length labial segments I 0.80, II 0.80, III 0.76, IV 0.40. First and fourth antennal segments enlarged, second and third slender. Length antennal segments I 0.36, II 0.78, III 0.66, IV 0.50. Total body length 5.25.

TYPES. Holotype. ♂ **North Caicos Isl.,** Horse Stable Beach, 23-X-93, on *Iva imbricata*, (R. M. & H. V. Baranowski). In U.S. National Museum of Natural History (NMNH). Paratypes. 54♂ 28♀, same data as holotype; 1♂, SAME except 26-XI-1994; 7♂ 14♀, Whitby 27-XI-94, on *Iva imbricata*, (R. M. & H. V. Baranowski). **Providenciales Isl.** 1♂, Grace Bay, 18-X-1993 (R. M. & H. V. Baranowski). In U.S. National Museum of Natural History, American Museum of Natural History, Natural History Museum, (England), Florida State Collection of Arthropods, R. M. Baranowski and J. A. Slater collections.

ETYMOLOGY. Referring to the beach habitat of the host plant.

Xyonysius acticola is readily distinguishable from the other West Indian species of *Xyonysius* by virtue of the elongate tylus and the relatively short fourth antennal segment. In *X. acticola* the length of the head measured along the midline from the level of the anterior margin of the eyes to the apex of the tylus is subequal to, or greater than, the length of antennal segment four. In both *X. californicus* and *X. basalis*, not only is the tylus less acuminate, but the fourth antennal segment is relatively much longer, more than one and one-half times the distance from the front margin of the eye to the apex of the tylus (1.66 is the lowest ratio in a series measured). The fourth antennal segment is also slightly shorter than segment three in *X. acticola*, but much longer than segment three in *X. californicus* and *X. basalis*.

Xyonysius acticola typically has a complete dark brown annulus on the distal half of the first antennal segment. Some specimens of *X. californicus* also have this complete annulus, but most specimens have only irregular dark markings rather than a complete distal annulus.

Actually *X. acticola* more closely resembles *X. naso* (Van Duzee) which is endemic (but widespread) on the Galapagos Islands. Like *X. acticola*, *X. naso* has the distance from the anterior margin of the eye subequal to the length of the fourth antennal segment. Both thus have noticeably more elongate acuminate heads than do other species of *Xyonysius*.

Xyonysius naso is readily separated from *X. acticola* by its much longer labium which extends posteriorly onto abdominal sternum three. In *X. acticola* the labium

Fig. 2. *Xyonysius acticola* Baranowski and Slater, **New Species**, dorsal view.

reaches between the metacoxae but not onto the abdominal sternum. This is reflected in the relatively much longer third labial segment in *X. naso* where labial segment three is slightly longer than segment two whereas in *X. acticola* it is shorter.

Xyonysius acticola is a relatively dark, often griseous appearing species with at least indications of four pale calloused patches across the middle of the pronotum and the calli cicatrices are never completely black. In the specimens of *X. naso* that we have examined the color is pale yellow (from Fernandina and Santa Cruz Islands) without any indication of pale calloused pronotal areas and with completely black pronotal cicatrices. Ashlock (1972) notes however that *X. naso* is quite variable in color (not geographically correlated incidentally) so that these color differences, although striking may not be definitive.

One of the most striking differences between these two long headed species is the shape of the bucculae. In *X. naso* the bucculae are very broad anteriorly, but narrow quickly and reach posteriorly only to the level of the anterior end of the antenniferous tubercles. In *X. acticola*, by contrast the bucculae are relatively low anteriorly but slope gradually and extend much further posteriorly to terminate at about the level of the anterior margin of the compound eyes.

It is interesting that both of these elongate headed species appear to be restricted in their use of host plants. Ashlock (1972) reported that *X. naso* was found breeding only on species of the endemic composite *Scalesia* and, as noted below, *X. acticola* is also restricted to a species of composite. This is in contrast to those mainland species of the genus for which biological data is available and which feed on a wide variety of plants.

Biology of *X. acticola*

Adults and nymphs of *X. acticola* were found in the seed heads of *Iva imbricata* Walt. (Asteraceae). According to Correll and Correll (1982) this plant is found in the southeastern United States, the Bahamas and Cuba. Eggs, frequently more than one, are deposited between the seed and sheath. Adults and nymphs appear to feed only on the seeds. This plant was found only in the sand dune areas of the islands, a habitat similar to that of sea oats, *Uniola paniculata* L.

Description of *X. acticola* Nymphs and Egg

Fifth instar (in alcohol)

Elongate, oval. Head, thorax, including wing pads a reticulated cream and brown with a few longitudinal brown irregular vittae. Abdomen a reticulated pink and cream, scent gland sclerites dark brown. Antennal segment I dark brown with distal tip cream, segments II and III yellow to tan, segment IV brown, segments I and IV slightly enlarged, segments II and III uniformly slender. Femora dark brown with proximal one third and distal tip cream; tibiae cream with distal one third brown; tarsi brown. Length head 1.10, width 1.0, interocular space 0.62. Length pronotum 0.62, width 1.60. Length wing pads 1.48. Length abdomen 2.55. Length labial segments I 0.70, II 0.70, III 0.72, IV 0.52. Length antennal segments I 0.28, II 0.52, III 0.46, IV 0.52. Total body length 5.22.

Fourth instar (in alcohol)

Similar in shape and color to fifth instar. Length head 0.70, width 0.80, interocular space 0.54. Length pronotum 0.38, width 1.10. Length wing pads 0.50. Length abdo-

men 1.84. Length labial segments I 0.44, II 0.54, III 0.44, IV 0.38. Length antennal segments I 0.20, II 0.32, III 0.30, IV 0.38. Total body length 3.25.

Third instar (in alcohol)

Similar in shape and color to preceding instars. Length head 0.60, width 0.60,interocular space 0.40. Length pronotum 0.26, width 0.76. Length wing pads 0.20. Length abdomen 1.40. Length labial segments I 0.38, II 0.46, III 0.44, IV 0.36. Length antennal segments I 0.12, II 0.20, III 0.18, IV 0.26. Total body length 2.55.

Second instar (in alcohol)

Similar in shape and color to preceding instars except head straw-colored with two irregular, longitudinal, tan, vittae on each side of midline. Thorax and abdomen reticulated cream and pink; thorax with one irregular, longitudinal, tan vitta on each side of midline. Length head 0.40, width 0.40, interocular space 0.30. Length pronotum 0.12, width 0.48. Length abdomen 0.78. Length labial segments I 0.30, II 0.36, III 0.30, IV 0.28. Length antennal segments I 0.10, II 0.12, III 0.14, IV 0,22, Total body length 1.46.

First instar (in alcohol)

Shape more elongate than preceding instars. Head and thorax brown. Abdomen similar to second instar. Legs colored as in preceding instar, but paler. Antennae light brown. Length head 0.38, width 0.30, interocular space 0.20. Length pronotum 0.14, width 0.30. Length abdomen 0.60. Length labial segments I 0.20, II 0.24, III 0.24, IV 0.24. Length antennal segments I 0.08, II 0.10, III 0.10, IV 0.20. Total body length 1.22.

Egg (in alcohol)

Elongate, straw-colored; length 1.1, width 0.3. Operculum 0.09 in diameter with 8-12 stalked, knobbed micropyles. Opercular end flattened, opposite end rounded.

The genus *Xyonysius* is confined to the Western Hemisphere. Previously nine species were recognized ranging from Chile and the Galapagos north to southern Canada (Slater and Baranowski 1990). Three species, including *X. acticola* are now recognized from the West Indies.

Acknowledgments

We thank Dr. Edwin L. Bridges (Curator, Fairchild Tropical Garden Herbarium, Miami, FL) for the identification of plant material, Dr. Robert W. Brooks (Snow Entomological Museum, U. Kansas, Lawrence, Kansas) for loan of specimens of *Xyonysius naso,* Mrs. Holly Glenn and Mrs. Julieta Brambila, Tropical Research and Education Center, for reviewing the manuscript and for assistance in labeling, pinning and curating material.We especially thank Mrs. Helen Baranowski who has accompanied the senior author and assisted in field collecting on many of the West Indian islands for many years. Florida Agricultural Experiment Station Journal Series No. R-04878.

References Cited

Ashlock, P. D. 1972. The Lygaeidae of the Galapagos Islands (Hemiptera: Heteroptera). Proc. California Acad. Sci. 4th Series: 39: 87-103.

CORRELL, D. S., AND H. B. CORRELL. 1982. Flora of the Bahama Archipelago. 1692 pp. J. Cramer.

LINDBERG, H. 1958. Hemiptera Insularum Caboverdensium Systematik, Okologie & Verbrietung der Heteropteren & Cicadinen der Kapverdischen Inseln. Comment. Biol. Helsingf. 19: 246 pp.

LINNAVOURI, R. 1978. Hemiptera of the Sudan, with remarks on some species of the adjacent countries 6. Aradidae, Meziridae, Aneuridae, Pyrrhocoridae, Stenocephalidae, Coreidae, Alydidae, Rhopalidae, Lygaeidae. Act. Zool. Fenn. 153: 1-108.

SAILER, R. I., AND J. C. M. CARVALHO. 1957. Miocene arthropods from the Mojave Desert California. Order Hemiptera - Suborder Heteroptera, *in* A. R. Palmer, Geol. Survey Professional Paper 294-G. 237-280.

SEIDENSTUCKER, G. 1953. Neue *Cymophyes*-arten aus Syrien und Kasakstan (Hem. Het., Lygaeidae). Ann. Entomol. Fenn. 19: 168-174.

SLATER, J. A. 1955. A revision of the subfamily Pachygronthinae of the world. (Hemiptera: Lygaeidae). Philippine J. Sci. 84: 1-160.

SLATER, J. A. 1966. A contribution to our knowledge of the Pachygronthinae (Hem.:Lyg.). J. Entomol. Soc. Queensland. 5: 51-65.

SLATER, J. A., AND R. M. BARANOWSKI. 1990. Lygaeidae of Florida (Hemiptera:Heteroptera). Arthropods of Florida and Neighboring Land Areas. Vol. 14, 211 pp. Florida Dept. Agr. and Consumer Serv. Div. of Plant Ind. Gainesville.