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September 2001

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## New species and records of *Rhyssa* and *Rhyssella* (Hymenoptera: Ichneumonidae: Rhyssinae) from Florida and Central America

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**Abstract.** *Rhyssa neotropicae* n. sp. is the first *Rhyssa* to be recorded from the New World tropics, where it was collected in cloud forest at 1800 m on Monte Uyuca near Zamorano, Honduras. It is closely related to the Nearctic *R. hoferi* Rohwer and *R. howdenorum* Townes but differs from all other *Rhyssa* by its complexly yellow and black marked head and body, whose color pattern mimics that of aggressive social vespid wasps (*Agelaia*) which occur in the same habitat. *Rhyssa howdenorum* Townes is recorded for the first time from Florida and Oklahoma. The genus *Rhyssella*, previously unknown in Florida, is represented in that state by *R. perfulva* n. sp., distinctive in its mostly orange brown coloration, and by *R. humida* (Say), a black and white species with fulvous on the thoracic pleura and propodeum.

**Resumen.** *Rhyssa neotropicae* n. sp. es la primera especie de su género de ser señalada para la Región Neotropical, donde se la coleccionó en selva húmeda de alta montaña a 1800 msnm en la cima del Monte Uyuca cerca de Zamorano en Honduras. Se trata de una especie muy afín a *R. hoferi* Rohwer y a *R. howdenorum* Townes, las cuales se distribuyen en el sur y centro de la Región Neártica, diferenciándose, no obstante, *R. neotropicae* de todas las demás *Rhyssa* por su bello esquema de coloración con intrincados diseños amarillos y negros, a semejanza del que ostentan unos véspidos sociales agresivos (*Agelaia*), que abundan en los mismos ambientes. Se cita por primera vez a *Rhyssa howdenorum* Townes para Florida y Oklahoma. El género *Rhyssella*, antes no conocido en la Florida, cuenta de hecho en este estado con 2 especies, *R. perfulva* n.sp., que destaca por tener el cuerpo casi uniformemente de color castaño claro anaranjado, y *R. humida* (Say), especie negra con diseños blancos y las pleuras torácicas junto con el propodeo en gran parte de color claro, entre anaranjado y rojo.

### Introduction

Rhyssines are among the most spectacular ichneumonids. Many species are large (fore wing length up to 30 mm), brightly colored, and all have the ovipositor at least as long as the body and in some cases as much as 3X as long. Often they may be found on recently dead or moribund tree trunks, in which they parasitize the larvae of wood boring Hymenoptera (Siricidae, Xiphydriidae). The following diagnosis will serve to distinguish the Rhyssinae from all other ichneumonid subfamilies: (1). Mesoscutum throughout with sharp, irregular, transverse ridges; (2). Propodeum without carinae; (3). Nervellus intercepted above the middle; (4). First tergite without a dorsolateral longitudinal carina between spiracle and apex; (5). Apex of last gastric tergite of female ends in a short, polished, apically truncate cornus or in a polished marginal boss. The only New World genera which might be confused with rhyssines because they also have a trans-rugose mesoscutum are *Pseudorhyssa* (Poe-

meniinae), *Apechoneura* (Labiinae), and perhaps a few species of *Xorides* (Xoridinae). In *Pseudorhyssa* there is a sharp dorsolateral longitudinal carina percurrent from spiracle to apex on the first gastric tergite and the last tergite is not modified into a cornus or boss. *Apechoneura* and *Xorides* have well developed propodeal areolation. The New World rhyssine fauna includes 4 genera, of which *Rhyssa* is Holarctic in distribution except for 1 species in Neotropical Central America (Honduras), *Rhyssella* is strictly Holarctic, *Epirhyssa* is Neotropic with about 50 described species (Porter 1978), (Gauld 1991), and *Megarhyssa* is Oriental, Ethiopian, and Holarctic with greatest diversity in the Oriental tropics.

### Genus *Rhyssa* Gravenhorst

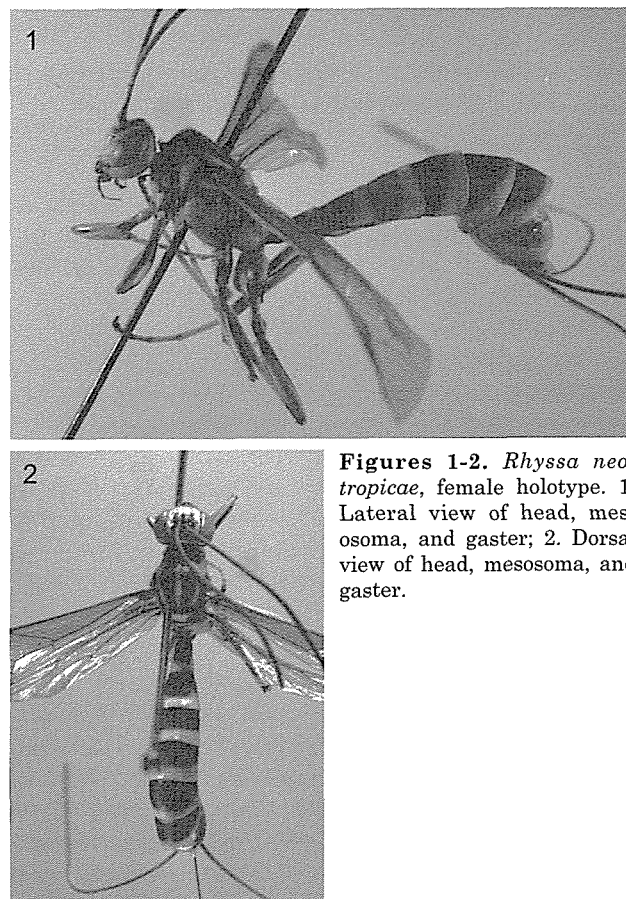
*Rhyssa* differs from other genera of its tribe by the following combination of characters: (1). Apical margin of clypeus with a median tubercle but never

with lateral tubercles; (2). No median longitudinal carina on ventral face of mid trochantellus; (3). Areolet usually present; (4). First tergite on each side at base with a large excavation (the glymma); (5). Sternites 3-6 in female with a pair of broad swellings or, often, well defined tubercles centered near their mid-length.

*Rhyssa* is a small, mainly Holarctic genus whose species parasitize larvae of siricine horn-tails (Hymenoptera: Siricidae), including the genera *Sirex*, *Urocerus*, and *Xeris*, which bore in recently dead coniferous trees, such as *Abies*, *Picea*, *Pinus*, and *Pseudotsuga* (Pinaceae) or *Juniperus* (Cupressaceae). There are 7 described species in the Nearctic Region, at least 2 in the Western Palaearctic, and 6 in the Eastern Palaearctic (Yu and Horstmann 1997). Townes (1960) has revised the North American species, Kasparyan (1981) gives a key to the European *Rhyssa*, while Wang and Hu (1993) furnish an account of the Chinese fauna. In this contribution I describe a new species of *Rhyssa* from Honduras, well within the Neotropics, record *Rhyssa howdenorum* Townes for the first time from Florida and Oklahoma, and provide a new record of *R. hoferi* from southeastern Arizona.

**1. *Rhyssa neotropicae* Porter, new species**  
(Figs. 1-2)

**DESCRIPTION: FEMALE.** Color: scape bright yellow below and black above; pedicel dusky; flagellum bright orange yellow below and more or less blackish above, especially toward apex; head bright yellow with mandible grading apicad through red brown into shining black on teeth as well as with the following black or brownish markings, dot on each tentorial pit, large blotch (ventrally paler) in malar space below eye, small blotch below each antennal socket on face, extensive area on median half of front, on much of vertex extending narrowly laterad to eye, on occiput, reaching narrowly ventrad along hind margin of temple, and on most of postocciput except that these black areas enclose an elongately triangular yellow blotch below mid ocellus whose vertex is prolonged on mid line toward level of antennal sockets as well as a large, transversely rectangular yellow blotch just posterior to median ocelli; mesosoma complexly patterned with black and yellow as follows: propleuron yellow becoming black distad of middle; pronotum yellow with blackish on front margin (paler above), in medio-dorsal longitudinal groove, in scrobe at level



**Figures 1-2.** *Rhyssa neotropicae*, female holotype. 1. Lateral view of head, mesosoma, and gaster; 2. Dorsal view of head, mesosoma, and gaster.

of epomia, and on a large blotch above insertion of front coxa; mesoscutum black with a broad, almost percurrent median yellow band which widens out anteriorly into a large blotch on each lateral lobe of mesoscutum, as well as with a broad yellow band on most of its lateral margin back to base of prescutellar carinae; prescutellar trough black; scutellum yellow; postscutellum mostly yellow; axillary troughs of meso- and metanotum mostly black, except that their apical carinae are narrowly yellow; mesopleuron laterally and ventrally in great part yellow except black on much of prepectus and around the (yellow) subalarum, with a pale dusky area on its lower front quadrant, and narrowly black in mesopleural suture; mesosternum yellow with black in mid ventral suture and more broadly black on hind face; upper metapleuron yellow with black rather broadly on its front margin; lower metapleuron yellow with black on margins; propodeum yellow with a broad, percurrent median black blotch that narrows abruptly near base and is narrowed again, more gently, near its mid length but which then widens out once more toward apex, as well as with a round black spot encircling each

spiracle; gaster blackish brown with a broad yellow apical band on each tergite which becomes wider laterally and extends some distance forward on lateral margins of tergites, especially so on 1 and on 5-8, as well as with yellow basally on tergites 6-8; legs black and yellow: fore coxa yellow with black on much of its apical half, fore trochanter yellow with light brown staining, especially below, fore trochantellus yellow with brownish suffusion, fore femur yellow with blackish on much of its posterior face and also ventrad, except that the dark color is interrupted by a broad yellow stripe that covers about apical half of posterior face, fore tibia yellow, and fore tarsus rather dull yellow with black on most of its apical segment; mid leg similar to fore leg but with more extensive black staining on coxa (percurrent on hind face), on trochanter and trochantellus, on femur, and with tibia broadly yellow except for a black band that covers most of its basal half dorsally and posteriorly; hind leg with coxa yellow dorsally and anteriorly but also with a broad black band on its dorsal surface that reaches almost to base of coxa and with a very large black area which covers its entire hind face and which toward apex is confluent with the dorsal black band, with trochanter brownish yellow above and clear yellow beneath, trochantellus light brown with yellow suffusion, femur blackish with front face and adjacent dorsal surface mostly yellow as well as with a wide yellow band on about apical 0.7 of its upper hind face, and with its apex mostly blackish, hind tibia yellow with black as described for mid tibia but more extensive, tarsus dullish yellow with brown on 4th segment and black on 5th; wings hyaline except for about anterior half of fore wing which is light brown, the dark coloration occupying all of median cell, submedian cell anteriorly, almost all of discocubital cell, all of radial cell, and more than anterior half of third cubital cell, the veins dark brown except with bright orange yellow on pterostigma and narrow anterior margin of costal vein.

Length of fore wing: 12.0 mm. Second flagellomere: on outer side with about 6 small, sharp, raised, elongately elliptic, irregularly disposed tyloids. Face: laterally with numerous medium sized, well separated punctures that emit long but sparse setae; medially becoming wrinkled, more obscurely punctate, and with even sparser setae. Clypeus: measured between anterior pits 1.2 as wide as distance between each pit and inner eye margin; with a broad median apical tubercle whose apex is gently rounded off. Temple: in dorsal view 0.54 as long as

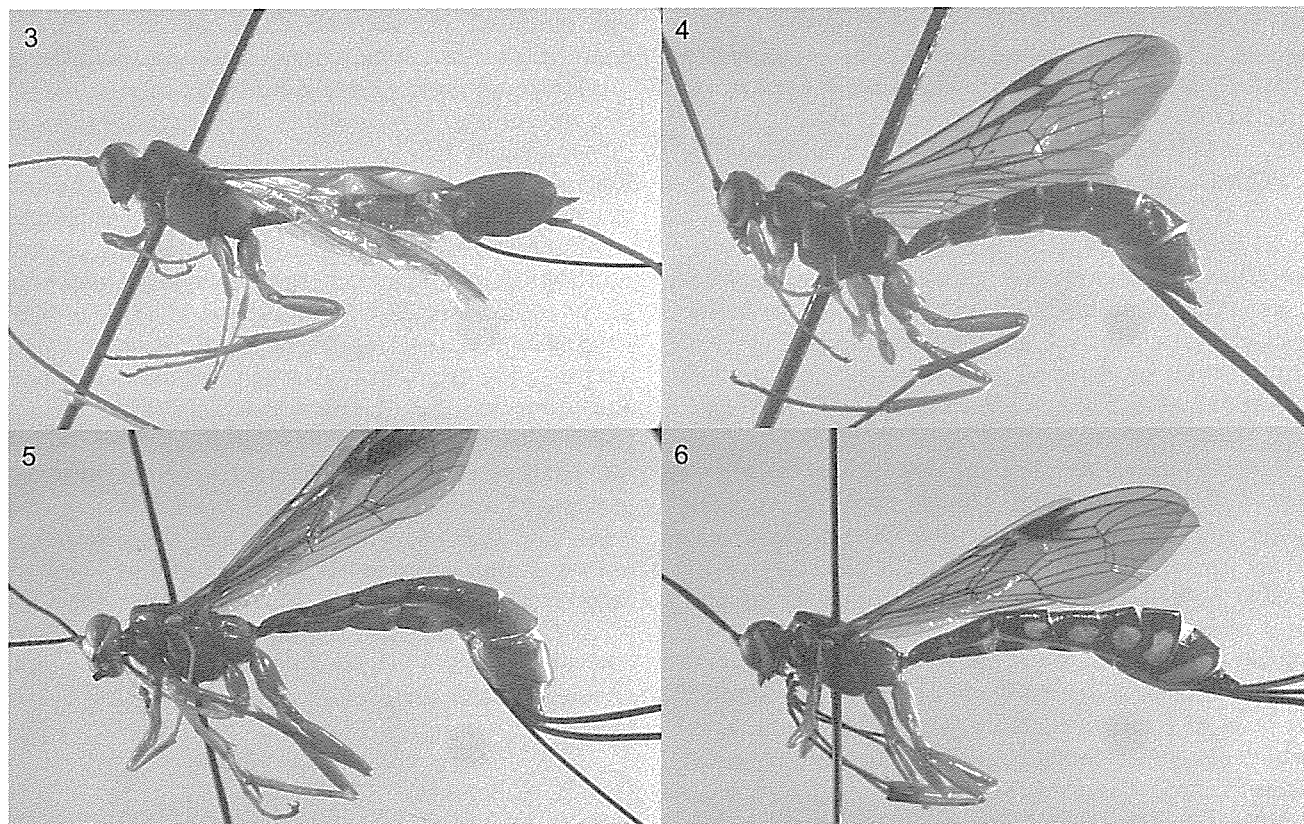
eye, rounded off, not expanded rearward. Ocelli: postocellar line 1.0 as long as oculo-ocellar line.

Prepectal carina: well defined on mesosternum but extending only a short distance onto lower mesopleuron, where it is faint, almost vestigial. Propodeum: laterally with many large, rather shallow punctures, micro-reticulation and intercalated stronger wrinkling, but becoming smoother toward midline. Wing venation: areolet briefly petiolate above, quadrangular; 3rd abscissa of cubitus 0.50 as long as 2nd abscissa. First gastric tergite: 1.5 as long as wide at apex; on disc with numerous large, shallow punctures and puncto-reticulation. Second gastric tergite: with numerous medium sized, strong but shallow, mostly adjacent to weakly confluent punctures and intercalated reticulate wrinkling, especially mesad and toward base; the punctures emitting short, dense setae which are at least as long as their interspaces, and somewhat overlapping. Cornus of apical gastric tergite: well differentiated from rest of tergite, parallel sided, 1.6 as long as wide at base. Ovipositor: sheathed portion 1.6 as long as fore wing.

MALE. Unknown.

TYPE MATERIAL. Holotype female, HONDURAS, Fco. Morazán, San Antonio del Oriente, Monte Uyuca, 1800 m, in Malaise trap, C. Porter, L. Stange. Holotype in FSCA.

RELATIONSHIPS. This elegant species may be distinguished at once from all other *Rhyssa* because it has a complex yellow and black color pattern on the head, body, and legs, and by virtue of its bicolored fore wing. It thus might be confused with one of the more brightly colored black and yellow species of the genus *Epirhyssa*, which belongs to the same tribe and has many species in Middle America and Neotropic South America, but in *Epirhyssa* there is no glymma on the first tergite and the areolet is always absent. Several sympatric *Dolichomitus* (Ephialtinae: Pimplini), such as *D. zonatus* Cresson and *D. annulicornis* Cameron, display much the same color pattern and also resemble rhyssines because they are large, elongate ichneumonids with the ovipositor about as long as the body, but in all Rhyssini the mesoscutum has strong transverse wrinkles, while in *Dolichomitus* the mesoscutum is practically smooth. All these ichneumonids seem to be Batesian mimics of aggressive, severely stinging, similarly colored social vespid wasps, such as *Agelaia* (= *Stelopolybia*) mul-



Figures 3-6. Lateral view of head, mesosoma, and gaster. 3. *Rhyssa hoferi*, female. Greenlee Co., Arizona; 4. *Rhyssa howdenorum*, female. Hudson, Maryland; 5. *Rhyssella perfulva*, female. Paratype; 6. *Rhyssella humida*, female. Suwannee River State Park, Florida.

*tipicta* Haliday, which are the most abundant and conspicuous Hymenoptera in the same habitats (see Porter 1978).

Within its genus, *Rhyssa neotropicae* belongs to the HOFERI species group, an otherwise strictly Nearctic assemblage in which at least the first four gastric tergites have continuous apical white or yellow bands (as opposed to discontinuous apical white spots in other groups), the face is sparsely setose, especially toward the midline, the prepectal carina is short and weak, and the second and third gastric tergites are densely and uniformly setose (Townes: 1960). Previously described species of the HOFERI group include *R. hoferi* Rohwer, known from the western United States (Colorado and Arizona), and *R. howdenorum* Townes which ranges over the southeastern and central United States from Maryland to Florida and west to Nebraska and Oklahoma.

*Rhyssa hoferi* differs from *R. neotropicae* in its orange red ground color; absence of sharply defined tyloids on second flagellomere; longer temple that in dorsal view is expanded rearward and 0.91 as long as eye (not expanded and only 0.54 as long as

eye in *R. neotropicae*); postocellar line 0.70 as long as oculo-ocellar line (1.0 in *R. neotropicae*); sessile, pentagonal areolet with 2nd recurrent vein inserted far distad, 3rd abscissa of cubitus 0.25 as long as 2nd abscissa; a little more coarsely puncto-reticulate second gastric tergite; and longer ovipositor, 2.0 as long as fore wing.

*Rhyssa howdenorum* is a black species with some white markings and red more or less extensively developed on the mesosomatic pleura and sterna. It differs structurally from *R. neotropicae* in lacking sharp tyloids on the second flagellomere; in that the clypeal width as measured between the anterior tentorial pits is 1.6-1.7 as long as distance between each pit and inner eye margin (versus 1.2 in *R. neotropicae*); in its more sparsely punctate and weakly wrinkled propodeal dorsum; finely aciculate, weakly wrinkled, and sparsely punctate postpetiole; more weakly wrinkled second gastric tergite with well spaced punctures emitting short, mostly sparse setae that are separated by much more than the length of their interspaces; and cornus of last gastric tergite not sharply differentiated from rest of tergite, its sides gently converging

toward apex in dorsal view, short and broad, 1.2 as long as wide at base (cornus of *R. neotropicae* well differentiated, parallel sided, 1.6 as long as wide at base).

**HABITAT NOTES.** The holotype was taken in a Malaise trap in tropical cloud forest at 1800 m on the summit of Monte Uyuca near Zamorano, Honduras. This mountain top community, surrounded on all sides at lower altitude by open pine woods, is dominated by oaks and other evergreen trees, whose branches support an epiphytic flora of bromeliads, orchids, and ferns. Tree ferns also appear in the shrub stratum of the forest. Some characteristic Hymenoptera include the ichneumonids *Dolichomitus irritator* (Fabricius) and *Clistopyga henryi* (Gauld) [Pimplini], *Coccygomimus croceipes* (Cresson) and *C. viridescens* (Morley) [Ephialtini], and *Idiolispa corderoi* Porter (Cryptini), the scoliid *Campsomeris ephippium* (Say), as well as the bumblebee *Bombus ephippiatus* (Say) [Apidae]. Since all other species of *Rhyssa*, including the closely related *R. hoferi* and *R. howdenorum*, are most often collected on standing dead coniferous trees and because every well documented host record for this genus involves siricine horn-tail larvae which bore in conifers, it may be assumed that *R. neotropicae* occurs in areas of the cloud forest where pines intermingle with oaks. Perhaps it occurs more widely in the monotonous pine woodlands at lower altitudes, but here the climate is much drier than on the highest peaks, and the widely spaced pines afford little shade, this is a dessicating environment inhospitable to moisture loving ichneumonids. Indeed, this kind of pine community, widespread in Central America and Mexico, may represent an anthropogenic disclimax which, after centuries of lumbering together with slash and burn agriculture, has replaced an originally more humid mixed pine and hardwood assemblage.

**BIOGEOGRAPHY.** Like *Idiolispa corderoi* Porter (1993) and other Holarctic elements in Central American tropical cloud forests, *Rhyssa neotropicae* probably derives from an ancestral stock that moved south in response to one of the Pleistocene glacial maxima or perhaps during a Miocene or Oligocene cold pulse. Cloud forests are few and very disjunct in Honduras, since the country has only 5 or 6 undisturbed peaks high enough to provide a suitable climate. Sparse and xeric pine woods occupy most of the country's central cordillera. Nonetheless, *Rhyssa neotropicae* (like the other hy-

menopteron species mentioned above) probably inhabits also the more extensive montane wet forests of Guatemala and México. During cooler and wetter episodes as recent as the Pleistocene glaciations, humid forests in Middle America were much more widespread than at present and probably formed a continuum at suitable altitudes across Honduras, allowing free dispersal of their characteristic biota. On the other hand, *R. neotropicae* might be a genuine relict, present only on Monte Uyuca. Much more fieldwork will be needed to elucidate these questions.

**SPECIFIC NAME.** *Neotropicae* is a latinized Greek adjective treated as a feminine noun in the genitive singular case; it is used to emphasize that the species so named is the first of its genus to be recorded from the New World tropics.

## 2. *Rhyssa hoferi* Rohwer

(Fig. 3)

**MATERIAL EXAMINED.** 1 female: UNITED STATES. Arizona, Greenlee Co., nr. Rose Peak, Strayhorse Forest Camp, 10-VIII-1965, on tree, R. H. Arnett. In FSCA.

The collecting locality is in Apache National Forest on US Highway 66 between Clifton and Alpine in the highlands of southeastern Arizona near the New Mexico border. Nearby Rose Peak reaches an altitude of 8787 ft (2703 m). In such habitats the predominant trees are pines and other conifers.

Previous records of *R. hoferi* are from Colorado (Garden of the Gods, Mesa Verde National Park) and northwest Arizona (Grand Canyon National Park) at altitudes of 2000 m or more. The species has never been reared, but it has been collected ovipositing in conifers, *Pinus edulis* and *Juniperus* sp. (Townes 1960). Of the 7 known specimens, 6 were collected between 15-23 June.

## 3. *Rhyssa howdenorum* Townes

(Fig. 4)

**MATERIAL EXAMINED.** 22 females and 1 male. UNITED STATES. Florida, Lake County, Forest Hills, Flight Trap, 22-V-1995, 1 female, F.W. Skillman, FSCA; Maryland, Eastern Shore, Dorchester County, nr. Hudson, on *Pinus taeda*, C. Porter, 1 male, 28-V-1966; 1 female, 4-VI-1966; 1 female, 6-VI-1966; 4 females, 8-VI-1966; 1 female, 9-VI-1966;



1 female, 11-VI-1966; 1 female, 12-VI-1966, 1 female, 12-VI-1969; 2 females, 14-VI-1966; 1 female, 15-VI-1966; 1 female, 21-VI-1965; 1 female, 24-VI-1965; 1 female, 26-VI-1965; 1 female, 28-VI-1965; 1 female, 1-VII-1965; 1 female, 4-VII-1965; 1 female, 3-VIII-1967; Oklahoma, Latimer County, IV-1987, 88, 89, 3 females, Karl Stephan. In FSCA and PORTER.

*Rhyssa howdenorum* now is known from Maryland, Virginia, North Carolina, Florida, Nebraska, and Oklahoma, where it has been collected ovipositing in recently dead trunks of southern pines, such as *Pinus taeda* and *P. virginiana*. At Hudson on the Eastern Shore of Maryland I found it moderately common in maturing, almost unispecific *Pinus taeda* forest where the pines were large and dense enough to give considerable shade, so that hardwood saplings (e.g., *Quercus*, *Liquidambar*) were becoming established in the understory. In the same forests I also collected *Urocerus cressoni* Norton, *Sirex edwardsii* Brullé, and *S. nigricornis* Fabricius (Siricidae: Siricinae), which probably are the hosts of *R. howdenorum* in this locality. *Pseudorhyssa maculicoxis* Kriechbaumer (Poemeniinae), another large ichneumonid with a long ovipositor, frequently was taken on the same trees visited by *R. howdenorum*. Spradbery (1969) has shown that *Pseudorhyssa* is a cleptoparasite of siricine horntails via a rhyssine primary parasite. The ovipositor of *Rhyssa* is adapted to drilling through an inch or more of wood to place an egg near a deeply tunneling horntail larva. *Pseudorhyssa* has a delicate ovipositor unsuited to boring but which can be threaded down a hole already made by a *Rhyssa* to access a parasitized siricid grub which soon falls prey to the cleptoparasite larva.

Like many other ichneumonids in the eastern states, *R. howdenorum* is most abundant in late spring and early summer. Of the 21 specimens from Hudson, Maryland, 1 was collected on 28 May, 16 between 4-28 June, 3 in July, and 1 in August. Farther south it seems to emerge a little earlier, with records in April from Virginia and North Carolina (Townes 1960) and Oklahoma, although the single Florida specimen is dated 22 May.

It should be noted that specimens from the northern extreme of the species' range have the head, mesosoma, and gaster predominantly black with red more or less developed on the lower mesopleuron, mesosternum, metasternum, and metapleuron. The unique female from Florida, however, has red on the temples, on much of the mesoscutum, on all thoracic pleura and sterna, almost

throughout on the propodeum, and the gastric tergites dully red stained. The 3 females from Oklahoma are less extensively rufous than the Florida specimen but more so than material from the Middle Atlantic states.

### Genus *Rhyssella* Rohwer

(Figs. 5-6)

*Rhyssella* may be recognized by the following combination of characters: (1). Clypeus with each apicolateral corner produced as a small tubercle but without a median apical tubercle; (2). Trochantellus of mid leg with a sharp ventral longitudinal ridge; (3) Areolet typically present, but often absent in small specimens, especially males. (4) First tergite without a glymma, spiracle located within basal 0.23-0.33 of its tergite; (5) Sternites 3-6 in female with a pair of tubercles located near base; (6). Tergites 3-6 of female largely covered with delicate transverse wrinkles; (7). Tergites 3-6 of male without a median apical submembranous area, their apical margins broadly concave.

This genus is very close to *Megarhyssa* from which it may be distinguished principally by its smaller average size (forewing length 5.5-15 mm; 10-30 mm in *Megarhyssa*), transversely aciculate rather than smooth or at least not uniformly wrinkled female gastric tergites 3-6; and by the gently concave apices of male tergites 3-6 (in *Megarhyssa* these have a broad, deep apical notch). The two genera also differ in certain rather obscure features of the male clasper, as noted by Townes (1960). Unfortunately, dwarf males of *Megarhyssa* may be difficult to separate from *Rhyssella* because they do not show the specializations of the gastric tergites and clasper that appear in specimens of normal size. Nonetheless, *Rhyssella* can be kept as a distinct genus, because it parasitizes xiphydriid wood wasps, while *Megarhyssa* exploits Siricidae. *Rhyssella* is a Holarctic genus which inhabits Temperate Deciduous Forests, where it attacks xiphydriids whose larvae bore in recently dead or moribund wood of angiosperm trees, including *Acer* (Aceraceae), *Alnus*, *Betula*, and *Carpinus* (Betulaceae), and *Tilia* (Tiliaceae). There are 2 described species in the Nearctic (Townes:1960), 2 in the western Palaearctic (Kasparyan:1981), 1 in Japan (Townes 1960), and 3 reported from China (Wang and Hu 1992).

Described herewith is a new species of *Rhyssella* from Florida and *Rhyssella humida* (Say) is recorded for the first time from Florida.

**1. *Rhyssella perfulva* Porter, new species**  
(Fig. 5)

**DESCRIPTION.** Female. Color: scape orange below and dusky above; pedicel blackish; flagellum blackish brown on about basal 0.7 and contrastingly light orange-yellow on most of apical 0.3 except for a little dusky staining on apical segment; head shining orange-brown with front, stemmaticum, temples rearward and occiput a little darker, a small dusky spot in malar space behind mandibular condyle, and with bright yellow markings as follows: very broadly almost throughout on inner orbits and on hind orbits as well (so as to cover most of temple), with a darker break only at top of eye and in malar space; mesosoma shining orange brown with bright yellow as follows: on lower front margin of pronotum below scrobe, very broadly on humeral margin of pronotum; on axillary sclerites; on tegula more dully; very conspicuously on the large and swollen subalarum; more obscurely on scutellum and on postscutellum laterally; and in part apicolaterally on propodeum; gaster pale orange brown with some weak dusky suffusion toward midline on tergites and a small black dot on front and hind corners of 2nd tergite; wings hyaline with light brown in base of radial cell and more weakly in adjoining part of discocubital cell; legs light orange brown to yellowish fulvous, the tarsi more dully so with dusky staining on segments 4 and 5, especially of hind tarsus. Length of fore wing: 9.5 mm. Face: with sparse, medium sized punctures intermingled toward midline with some delicate transverse wrinkling. Pronotum: with numerous but sparse, small punctures on its swollen humeral margin. Temple: 0.70 as long as eye in lateral view. First gastric tergite: 1.80 as long as wide at apex; with dorsolateral carina sharp and straight between base and spiracle. Ovipositor: sheathed portion 1.49 as long as fore wing.

**MALE.** Differs from female as follows: Color: scape mostly clear yellow below; apical 0.25 of flagellum brighter, more nearly yellow; yellow on head and mesosoma more extensive, including all of face, temples and postocciput, a pair of longitudinal stripes on mesoscutum, all of scutellum except for a little orange staining mesad, all of postscutellum, most of tegula, most of prepectus, much of mesepimeron, basad on prescutellar carinae, narrowly on hind margins of meso- and metanotal axillary troughs, on greater part of lower metapleuron (with reddish suffusion except clear yellow apicolaterally), on a large blotch covering

apicolateral 0.3 of propodeum; gaster with tergites 1 and 2 darker brownish than in female, with black staining toward apex of tergite 5, and more broadly blackish on 6 and 7, as well as with a large circular yellow spot on 3rd tergite subapicolaterally; wings hyaline throughout: fore leg extensively yellow with much light orange staining on femur, tibia mostly yellow, and tarsus duller yellowish with weak reddish brown suffusion; mid leg with coxa and trochanters mostly yellow with a little reddish staining, tibia dusky fulvous above and yellowish below, and tarsus dull orange with some dusky staining, especially on segments 2-5, and yellowish toward base on 1st segment; hind leg with coxa clear orange brown with a broad yellow blotch above near base, trochanter mostly yellow, trochantellus orange brown with dusky staining, femur bright orange brown, and tibia dusky above but otherwise dull orange to yellowish brown.

Length of fore wing: 8.0 mm. Temple: 0.66 as long as eye in lateral view. First gastric tergite: 1.61 as long as wide at apex.

**TYPE MATERIAL.** Holotype, female, UNITED STATES, Florida, Alachua County, Gainesville, University of Florida Natural Area Teaching Laboratory, mesic hardwoods nr. Doyle Conner Building, 23-III-1994, C. Porter; Paratypes, 7 females and 2 males: Florida, Alachua County, Gainesville, 610 NW 54th Terrace, in Malaise Trap, 1 female and 1 male, 20-29-III-1995, L. A. Stange; 9 mi NW Gainesville, San Felasco State Preserve, mesic hardwoods, 1 male, 28-X-1985, C. Porter; University of Florida Horticulture Unit, SR 232, 1 female, 11-22-III-1967, 1 female, 16-19-III-1997, 1 female, 20-24-IV-1977, H. Greenbaum; Clay County, Goldhead Branch State Park, ravine hardwoods, in Malaise Trap, 1 female, 16-II-12-III-1997, C. Porter, L. Stange; Duval County, Jacksonville, 1 female, 4-IV-1980, at blacklight, Charles F. Zeiger; Suwannee County, Suwannee River State Park, riparian hardwoods, in Malaise Trap, 1 female, X-1995, C. Porter, L. Stange. In FSCA.

**VARIATION.** The foregoing description applies to the female holotype and the male paratype from San Felasco State Preserve. The 6 female paratypes vary among themselves and with regard to the holotype as follows: Color: front, stemmaticum, and occiput sometimes uniformly orange, without dusky staining; face sometimes mostly yellow with only limited orange suffusion toward midline; sometimes with a pair of yellow longitudinal stripes on



mesoscutum; sometimes with a yellowish area on mesopleuron below subalarum; yellow blotch on apicolateral surface of propodeum sometimes very extensive, or sometimes confined to extreme apex, almost absent; gaster often uniformly orange brown, without dusky areas except for small dots in front and hind corners of 2nd tergite; fore wing in larger specimens may have a conspicuous dark brown blotch that covers about basal 0.3 of radial cell and about 0.4 of discocubital cell; fore tarsi and tibiae sometimes yellowish. Length of fore wing: up to 12.0 mm. Temple: 0.75-0.83 as long as eye in lateral view. First gastric tergite: 1.60-1.87 as long as wide at apex. Ovipositor: 1.42-1.66 as long as fore wing. The second male paratype (Gainesville, L. A. Stange) differs as follows from the male collected at San Felasco Preserve: Color: postocciput mainly orange brown; yellow vittae on mesoscutum faintly defined; scutellum mostly orange brown with yellow staining weak, except on margins; mesopleuron without conspicuous yellow markings, except on subalarum; no yellow on lower metapleuron; propodeum without a large yellow blotch apicolaterally, but vaguely tinged with yellow at apex; gaster almost uniformly light orange, with little dusky staining except on dorsum of 6th tergite and without a yellow spot laterally on 3rd tergite; mid femur extensively yellow; hind coxa inconspicuously marked with yellow above near base. Length of fore wing: 6.0 mm. Temple: 0.85 as long as eye in lateral view. First gastric tergite: 2.14 as long as wide at apex.

**RELATIONSHIPS.** In addition to *R. perfulva*, two other species of *Rhyssella* are known from the United States and southern Canada (Townes 1960). Of these, *R. nitida* (Cresson) ranges from Maine and Quebec south to the Carolinas and west to Minnesota and Iowa, with an apparently disjunct population in British Columbia, while *R. humida* (Say) occurs in eastern North America from Vermont to Minnesota and south to Florida and Mississippi.

*Rhyssella nitida* may be recognized by its uniformly black mesosoma and gaster (without white or fulvous markings) and because it has fine, dense punctures on the humeral margin of the pronotum. In both *R. humida* and *R. perfulva* the pronotal dorsum is sparsely punctate and the body has conspicuous fulvous and/or white coloration. *Rhyssella perfulva* is almost wholly orange or orange brown with some yellow markings and a little dusky staining, while *R. humida* is black with

orange more or less well developed on the metasomal pleura and with conspicuous white markings on both the mesosoma and gaster, including large subapical lateral spots on tergites 3-7.

Apart from color, there is little to distinguish *R. humida* from *R. perfulva*. In *R. perfulva* the dorso-lateral carina of the first gastric tergite is sharp and straight between the base and the spiracle (in *R. humida* this carina is irregular and often weaker) and both the temple and the ovipositor average slightly longer than in *R. humida*. At first it appeared that *R. perfulva* was a southern subspecies of *R. humida*. Recently, however, typical specimens of both *R. humida* and *R. perfulva* were collected in the same Malaise trap at Suwannee River State Park near Live Oak in northwestern peninsular Florida. This shows that the two forms occur in sympatry without intergradation, so it is best to regard them as distinct species.

**HABITAT NOTES.** All records of this species are from well-shaded sites in mature Temperate Hardwood Forest, such as in the ravine at Goldhead Branch State Park, in the San Felasco State Preserve, and along the riparian nature trail at Suwannee River State Park. Overstory trees in these habitats include *Magnolia* (Magnoliaceae), *Quercus* (Fagaceae), *Carya* (Juglandaceae), *Liquidambar* and *Persea* (Lauraceae), while *Ostrya* (Betulaceae), *Cornus* (Cornaceae), *Aralia* (Araliaceae), *Osmanthus* (Oleaceae), *Ilex* (Aquifoliaceae), and *Symplocos* (Symplocaceae) are conspicuous in the shrub stratum.

**PHAENOLOGY.** *Rhyssella perfulva* has been collected in spring and again in fall, with 6 records for March, 2 for April, and 2 in October. Most Florida ichneumonid genera follow this same pattern, with an impressive peak of abundance and diversity between late February and May, a steep decline through the hottest months from late June to the end of September, and another peak in October, November and December or, if the weather stays mild, many genera continue active all through the winter.

**SPECIFIC NAME.** The specific name is derived from the Latin intensive prefix *per*, "through, throughout" combined with the adjective *fulvus a-um*, "reddish yellow, tawny", in reference to the fulvous ground color that characterizes this species.

## 2. *Rhyssella humida* (Say)

(Fig. 6)

**MATERIAL EXAMINED.** 7 females. UNITED STATES. Florida, Suwannee County, Suwannee River State Park, riparian hardwoods, 4 females, 1-15-III-1997, 2 females, 15-VI-1997, 1 female, IX-1997, Malaise Trap, C. Porter, L. Stange. In FSCA. These constitute the first records of *R. humida* in the state of Florida, although its appearance here is not surprising because Townes (1960) cites it from North and South Carolina and from Nicholson, Mississippi deep in the Lower Austral Zone not far across the state line from New Orleans, Louisiana.

**VARIATION.** The Florida specimens agree with material from the northeastern states but have the white markings, especially the lateral spots on gastric tergites 3-7, conspicuously larger, and the orange red color more broadly developed on the thoracic pleura and propodeum.

**HOSTS.** This species has been reared in Pennsylvania and Maryland from *Xiphydria* spp. in *Tilia* (Tiliaceae) and in *Carpinus caroliniana* (Betulaceae), as well as from *Xiphydria abdominalis* Say in an unidentified host tree (Townes 1960).

### Collections

**FSCA.** Florida State Collection of Arthropods, Florida Department of Agriculture and Consumer Services, Division of Plant Industry, P.O. Box 147100, Gainesville, Florida 32614-7100.

**PORTER.** Collection of Charles C. Porter, currently housed at The Florida State Collection of Arthropods.

### Acknowledgments

The Escuela Agrícola Panamericana provided transport in Honduras, personnel to service a Malaise Trap set up on Monte Uyuca (in which *Rhyssa neotropicae* was collected), as well as lodging and laboratory facilities. I am especially indebted to Dr. Ronald L. Cave (Chief Entomologist) and to Dr. Keith Andrews (Director) of the Departamento de Protección Vegetal at Zamorano, Honduras. I wish

also to thank Dr. Lionel A. Stange and Dr. Mike Thomas of the Florida Department of Agriculture and Consumer Services at Gainesville for access to the FSCA and support of fieldwork in Florida. Mr. Jeffrey Lotz of the same institution took the photographs of rhyssine ichneumonids. The Florida Department of Recreation and Parks issued permits which facilitated collecting in Florida State Parks.

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