



## First record of Nesomesochorinae (Hymenoptera: Ichneumonidae) from America north of Mexico with descriptions of two new species of *Nonnus* Cresson

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### Abstract

The subfamily Nesomesochorinae is recorded for the first time from America north of Mexico. Two new species of *Nonnus* (Hymenoptera: Ichneumonidae: Nesomesochorinae) are described, both from Arizona, USA and Mexico. Diagnostic characters and figures are provided to distinguish these two new species from congeners in North and Central America.

**Key words:** *Nonnus*, new species, Arizona, Mexico, distributional range extension

### Introduction

The genus *Nonnus* Cresson is a rather enigmatic member of the New World ichneumonid fauna. Prior to this study, its species were recorded from Argentina to southern Mexico (Townes & Townes 1966); they range in length from 6–23 mm and can be locally abundant. For all this, the genus is poorly known. Of the 18 described species, 15 are known only from South America and all but one were described before 1920 (Townes & Townes, 1966; Yu *et al.*, 2016). Host information is completely lacking. Thus the discovery of two species from Arizona provides an opportunity to bring attention to this interesting taxon.

*Nonnus* is a distinctive addition to the Nearctic fauna. The head in frontal view has the eyes distinctly convergent ventrally. The metasoma is petiolate and laterally compressed, with the first segment cylindrical and the spiracle slightly beyond the midpoint. Fore wing cell 1+2Rs (the areolet) is pentagonal. The metanotum in dorsal view has large lateromedian triangular projections that are 0.2 or more times as long as the propodeum. The ventral portion of the pleural sulcus is absent. Finally, the ovipositor is long, approximately the length of the fore wing. *Nonnus* is the sole New World genus of Nesomesochorinae; the subfamily can be identified using online subfamily keys (Wahl, 2019).

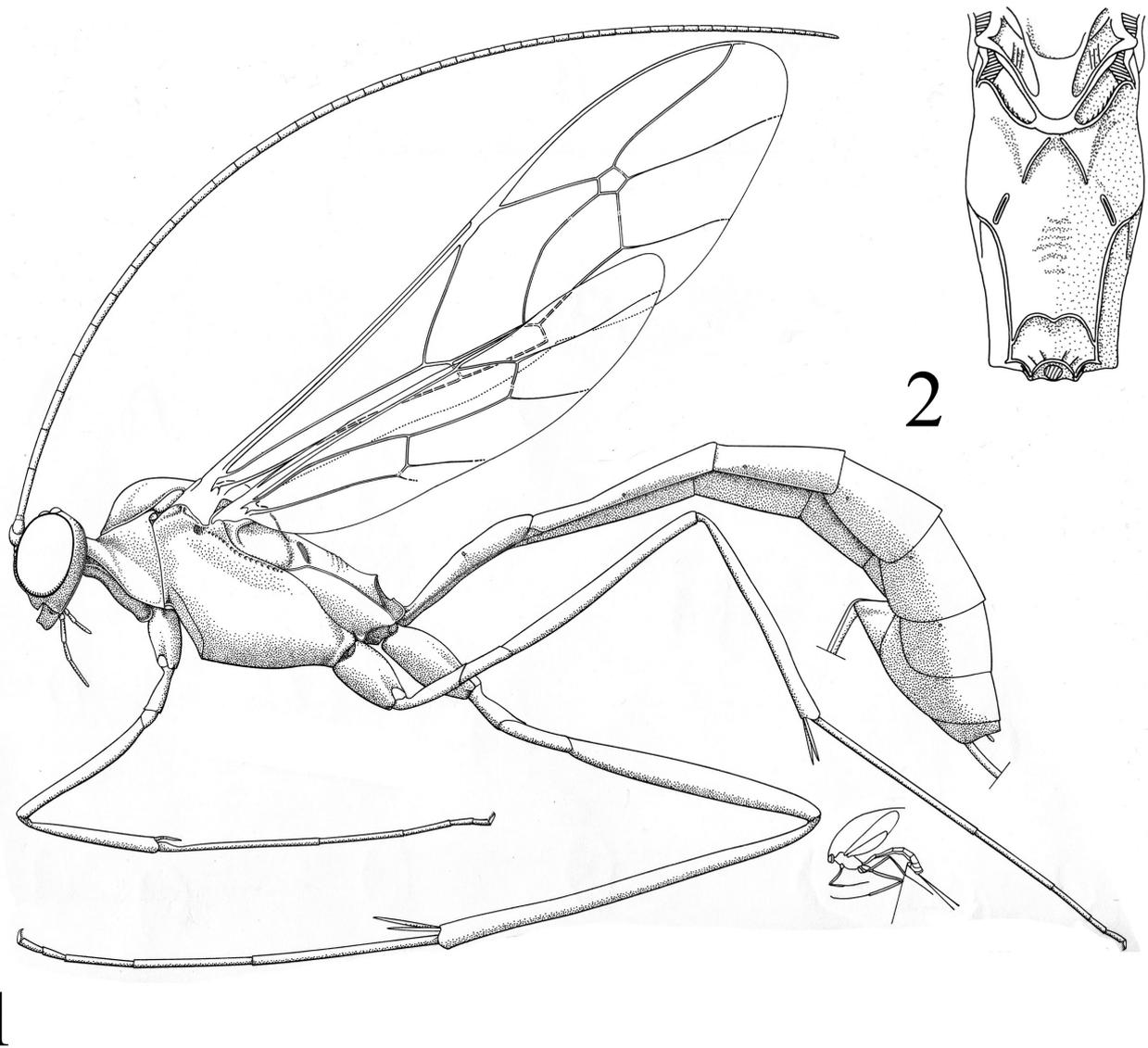
Two *Nonnus* males collected from Arizona, USA, belonging to obviously different species, are in the collections of the Canadian National Collection of Insects and Utah State University. Do they represent new species? Mexico and Central America have two species described from Mexico (*N. antennatus* Cresson and *N. atratus* Cresson; Cresson, 1874) and a South American species reported in Panama (*N. niger* (Brullé); Brullé, 1846; Krieger, 1903). The Cresson types were borrowed from the Academy of Natural Sciences of Philadelphia at Drexel University; material compared to the relevant Brullé types is in the Utah State Collection. We conclude that the Arizona specimens represent new two species, both of which have ranges that extend through central Mexico to the Isthmus of Tehuantepec. The reasoning behind our conclusions is presented below in the Comments section for each species.

Besides the two Cresson species and the two new species described herein, we have seen approximately 25 undescribed *Nonnus* species from Mesoamerica. This makes placement of the new species within a key unworkable because the majority of specimens in collections are undescribed and hence would not key out properly. The new species in this paper are described taking these species from other regions of Mesoamerica into account, giving us some degree of confidence that *N. barnesae* and *N. spurius* may be readily recognized by others workers. A com-

plete revision of all Mesoamerican *Nonnus* is a huge undertaking, especially because one would have to consider all the described species in South America and many more undescribed. Nevertheless, we feel that the description of these two species is justified as a separate study because of the northward range extension that their distributions represent.

*Nonnus* has not been reviewed using modern methodology, and it is interesting to note that a fair degree of sexual dimorphism exists. There are, of course, the usual differences in metasomal morphology between the sexes. Metasomal color difference can exist and some care must be taken in matching up the sexes. The most striking difference is in surface sculpture and punctation. Females generally have a granulate surface with relatively shallow punctures; males tend to have the surface smooth to weakly granulate, with deeper punctures. This needs to be kept in mind when attempting sex associations.

As mentioned previously, no host records exist for *Nonnus*. The late Ian Gauld noted (pers. comm. to DBW) that the intensive survey of Costa Rican Lepidoptera and their parasitoids by Daniel Janzen and his collaborators has failed to rear *Nonnus*. These wasps are extremely common in the Área de Conservación Guanacaste, suggesting that the genus does not parasitize Lepidoptera. It is very probable that *Nonnus* is an endoparasitoid, given that it is placed amongst the derived endoparasitoid Ophioniformes (Bennett *et al.*, 2019). The long and rather flexible ovipositor argues for a concealed host. The mystery host taxon (or taxa) is found in a wide variety of habitats, ranging from tropical forests to the temperate pine and oak woodlands of Arizona.



**FIGURES 1–2.** *Nonnus* spp. 1. Lateral habitus, *N. bicolor* (Schmiedeknecht). 2. Dorsal view of posterior mesosoma, *N.* sp.

## Materials and methods

The specimens examined in this study were deposited in the following collections:

ANSP	Academy of Natural Sciences at Drexel University: Philadelphia, Pennsylvania, U.S.A.
CNCI	Canadian National Collection of Insects, Agriculture Canada: Ottawa, Ontario, Canada
EMUS	Utah State University Entomology Museum: Logan, Utah, U.S.A.
TAMU	Texas A & M University Insect Collection: College Station, TX, U.S.A.

The morphological terminology follows Bennett *et al.* (2019). Mesosomal elongation is expressed by the length of the mesosoma (measured from the pronotal anterior margin to the propodeal posterior margin) divided by the mesosomal depth (as measured from the scutellum to the mesothoracic ventral surface). Reference to metasomal color in the descriptions applies only to the tergites and first sternite unless otherwise indicated. When the lengths of the body and wing are given, the value in parentheses are those of the holotype. Structural characters in descriptions are numbered in order to help comparison between species and ensure their uniformity.

Images for plates were taken with an EntoVision micro-imaging system. This system consists of a Leica M16 zoom lens attached to a JVC KY-75U 3-CCD digital video camera that feeds image data to a desktop computer. The program Archimed 5.3.1 is then used to merge an image series (representing typically 15-30 focal planes) into a single in-focus image. Lighting was provided by an EntoVision dome light.

### *Nonnus barnesae* Wahl & Bennett, sp. nov.

(Figs. 3–5, 15)

**Diagnosis.** *Nonnus barnesae* is easily distinguished from other North and Central American species by its mesosomal pattern of black areas on a brownish-red background (Figs. 3–5).

**Description. Female. Structure.** 1. Supraclypeal area centrally smooth and punctate, punctures deep and ranging from adjacent to separated by  $0.5\times$  their diameter; supraclypeal width just below antennal sockets: width just above clypeal suture = 1.0: 0.7–0.8; eyes strongly convergent ventrally. 2. Supra-antennal area without projections; antenna with 42–46 flagellomeres. 3. Mesosoma elongate, about  $1.7\times$  as long as deep. 4. Lateral face of pronotum with posterodorsal area centrally weakly to moderately granulate with small scattered shallow punctures, dorsal and posterior margins granulosopunctate. 5. Mesopleuron centrally smooth to weakly granulate, punctures 15–30  $\mu\text{m}$  in diameter and separated by  $0.3\text{--}1.0\times$  their diameter. 6. Mesoscutum with lateral lobe granulate with shallow punctures separated by  $0.3\text{--}1.0\times$  their diameter; median lobe defined by shallow notauli extending about  $0.7\times$  length of mesoscutum. 7. Ventral division of metapleuron granulate, punctures about 15  $\mu\text{m}$  in diameter and separated by  $0.3\text{--}0.5\times$  their diameter. 8. Propodeum granulate and with scattered punctures; carinae absent except for posterior transverse carina (PTC) and sections of median longitudinal carinae between PTC and propodeal apex; area anterad PTC with numerous strong rugulae, longitudinal near PTC then becoming transverse, extending about 0.8 distance to anterior propodeal margin and confined to median 0.3 of propodeum. 9. MS1 slender, usually with weak dorsal convexity on petiole (Fig. 3). 10. Thyridium ovoid, granulate and of lighter color than surrounding tergite, and connected to base of T2 by narrow ridge (as in Fig. 11). 11. Ovipositor  $2.4\text{--}2.8\times$  as long as length as hind femur, straight with apical 0.3 slightly decurved (occasionally flexed to form gentle curve). **Color.** Head black to fuscous, with apical 0.5 of mandible dark brown; antenna dark brown to fuscous except for white dorsal surfaces of flagellomeres 1–4 (becoming progressively reduced until flagellomere 4 with only narrow short strip or sometimes with strip absent) and white band on flagellomeres 10–16 (comprising 4–6 flagellomeres for any one individual; note band is symmetrical, not extending further on dorsal surface than on ventral). Mesosoma brownish-red with following areas black/fuscous: propleuron, median region of median mesoscutal lobe, ventral 0.3 of mesopleuron and mesothoracic venter, ventral anterior region of metapleural ventral division, paired ovoids on propodeum immediately adjacent to propodeal-metanotal sulcus. Legs brownish-red. Wings with membrane with weak brown tint, and veins brown to dark brown. Metasoma: MS1 varying from completely brownish-red to having basal 0.2, ventral area, and apical 0.2 of postpetiole dark brown/fuscous; T2–3 varying from completely brownish-red to being dark brown with only apicolateral areas dark brownish-red to being completely dark brown; T4+ light brown to fuscous except for

yellowish-white median mark on T7 posterior margin. *Measurements*. Body 14.8–16.3 mm (14.8 mm); fore wing 8.3–10.4 mm (8.5 mm).

**Male. Structure.** 1. Supraclypeal area smooth and punctate, punctures deep and ranging from adjacent to separated by 0.5× their diameter; supraclypeal width just below antennal sockets: width just above clypeal suture = 1.0: 0.7–0.8; eyes strongly convergent ventrally. 2. Supra-antennal area without paired median lamellar projections below median ocellus; antenna usually with 49–52 flagellomeres (Arizona specimen with 45 flagellomeres). 3. Mesosoma elongate, about 1.7× as long as deep. 4. Lateral face of pronotum with posterodorsal area centrally smooth, ranging from impunctate to having small scattered punctures dorsally and posteriorly, dorsal margin punctate and posterior margins crenulate. 5. Mesopleuron centrally smooth, punctures 10–30 µm in diameter and separated by 0.5–1.0× their diameter. 6. Mesoscutum with lateral lobe weakly granulate to smooth, with deep punctures separated by 0.5–2.0× their diameter; median lobe defined by shallow notauli extending about 0.7× length of mesoscutum. 7. Ventral division of metapleuron smooth, punctures 7–15 µm in diameter and separated by 1.0–4.0× their diameter. 8. Propodeum smooth to weakly granulate, lateral margins usually with weak punctures separated by 0.3–0.5× their diameter; carinae absent except for PTC and sections of median longitudinal carinae between PTC and propodeal apex; area anterad PTC with numerous strong rugulae, longitudinal near PTC then becoming transverse, extending about 0.8 distance to anterior propodeal margin and confined to median 0.3 of propodeum. 9. MS1 slender, without weak dorsal convexity on petiole. 10. Thyridium extremely elongate and almost effaced; not connected to base of T2 by narrow ridge (as in Fig. 11). *Color*. Head black to fuscous, with apical 0.5 of mandible dark brown, clypeus rarely with 0.3 of apical margin dark brown; antenna dark brown to fuscous except for white (completely or partially) flagellomeres 15–21 (comprising 2–7 flagellomeres for any one individual). Mesosoma brownish-red with following areas black/fuscous: anterior 0.8 of median mesoscutal lobe, ventral 0.3 of mesopleuron and mesothoracic venter, ventral division of metapleuron except for dorsal lateral region, ovoid on dorsal division of metapleuron, paired ovoids on propodeum immediately adjacent to propodeal-metanotal sulcus (occasionally absent); propleuron dark brown on basal 0.5. Fore and middle legs brownish-red except for brownish-yellow trochanter and trochantellus of fore leg, and occasional brown ventral surface of fore and middle coxae. Hind leg with coxa, trochanter, trochantellus, and femur brownish-red except for occasional dark brown of coxal ventral surface; tibia with basal 0.7 brownish-red, apical 0.3 dark brown; tarsus with basal 0.8 of tarsomere 1 and tarsomeres 4–5 dark brown, remainder of tarsus white. Wings with membrane with weak brown tint, and veins brown to dark brown. Metasoma: MS1 brownish-red, with brown anterior 0.2 and dorsal and ventral surfaces; T2–4 usually brownish-red except for brown of median 0.9 of T2 and apical 0.3 of T4; T5 ranging from completely dark brown to mottled with brownish-red; T6+ dark brown/fuscous. *Measurements*. Body 11.8–18.0 mm; fore wing 7.3–9.0 mm.

**Material.** Holotype F: **MEXICO**, Durango: 24 mi. west of La Ciudad, 7000 ft., 25.vi.1964, W.R.M. Mason (CNCI). Condition of holotype: intact except for missing left hind tarsus. Paratypes. **MEXICO**, Colima: 3FF, 1M, 9 mi. NE Comala, 17–18.vii.1983, Kovarik-Harrison-Schaffner (TAMU); Durango: 1F, 3 mi. east of El Salto, 8400 ft., 21.vi.1964, W.R.M. Mason (EMUS); 1F, same data as preceding except 8500 ft. and 10.vii.1964 (CNCI); 1M, 8 mi. east of El Salto, 8500 ft., 23.vi.1964, W.R.M. Mason (CNCI); 1F, 10 mi. west of El Salto, 9000 ft., 8.vii.1964, W.R.M. Mason (CNCI); Jalisco: 1F, Nevado de Colima road, 8 mi. west of highway junction (near Atenquique), 3.viii.1988, Ferreira & Schaffner (TAMU); Michoacan: 1M, Tancitaro, 6586 ft., 15.vii.1940, Hoogstraal & Knight (EMUS); Morelos: 1F, 15 km. north of Cuernavaca, 4.vii.1951, H.E. Evans (EMUS); Oaxaca: 1F, Vista Hermosa (17° 37' 59.0"N, 96° 20' 31.6"W), 1450 m, 20.x.1962, H. & M. Townes (EMUS); Sinaloa: 1F, 15 mi. west of El Palmito, 5000 ft., 25.vii.1964, W.R.M. Mason (CNCI); 1M, same data as preceding except 30.vii.1964 (CNCI); 3M, same data as preceding except 4.viii.1964 (CNCI, EMUS). **USA**, Arizona: Coconino Co., Coconino National Forest, Kinder Crossing (34° 33.93'N, 111° 08.7'W), 6460 ft., 10.ix.2014, J.E. O'Hara (CNCI).

**Comments.** *Nonnus barnesae* is one of the most distinctive North and Central American *Nonnus* species. While there are quite a few species with a predominately brownish-red body coloration, such as *N. antennatus* Cresson (Fig. 9), none of them have the *barnesae* pattern of black areas on the mesosoma (Figs. 3–5).

There is some minor variation in color pattern. In females: 1) the propleuron can have the lateral margins brownish-red; 2) the mesothoracic venter in one specimen has paired elongate brownish-red ovoids; 3) the paired dark ovoids on the propodeum are occasionally absent. In males, the amount of the brownish-red on the first four metasomal segments is variable, ranging from the condition in the male description to completely brownish-red (this in only one specimen).

The range of *barnesae* is mostly concurrent with *spurius*: ranging from the Isthmus of Tehuantepec north through the Sierra Madre Orientale to Arizona (Fig. 17).



**FIGURES 3–4.** *Nonnus barnesae* Wahl & Bennett, lateral habitus. 3. Holotype female; AEI photo voucher specimen #1075. 4. Paratype male (Mexico: Oaxaca); AEI photo voucher specimen #1076.

The label for the Vista Hermosa specimen reads as follows: Vista Hermosa, Oax., Mex./96.5 Km. SW of Tuxtepec/[date] 1450 m/H. & M. Townes. This led to frustration in trying to find the locality, until the Townes' collecting notes were consulted. The locality was originally recorded by them as near kilometer marker 96 (the Townes' estimated the fractional value) on the road from Valle Nacional to Oaxaca (city). It is **not** 96.5 linear kilometers southwest of Tuxtepec. The latitude and longitude for Vista Hermosa are given above under "Material".

**Etymology.** This species is named after Diana Barnes, in recognition of her many years of collaboration with the junior author on the systematics of Ichneumonidae.

***Nonnus spurius* Wahl & Bennett, sp. nov.**

(Figs. 6–8, 11, 16)

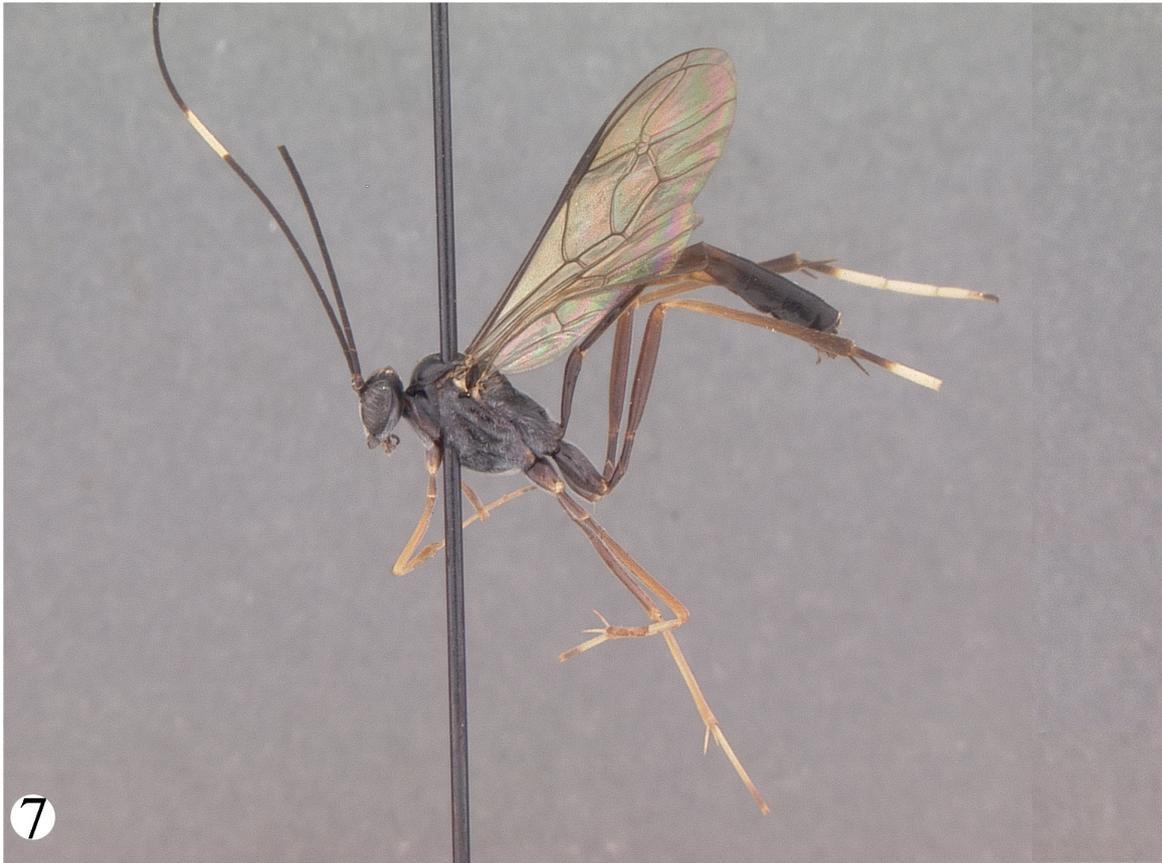
**Diagnosis.** *Nonnus spurius* can be distinguished from other North and Central American species of *Nonnus* by the combination of the following characters: eyes strongly convergent ventrally; female flagellar band symmetrical, not extending further on dorsal surface than on ventral surface; female body uniformly black/fuscous; female mesopleuron weakly granulate with distinct punctures separated by 0.5–1.0× their diameter; ovipositor 2.2–2.4× as long as length of hind femur, straight with apical 0.3 slightly decurved; male supra-antennal area lacking median lamellar projections; male mesosoma black/fuscous, metasoma with T1, most of T2, and T5+ dark brown **and** T3–4 light to deep brownish-red.

**Description. Female. Structure.** 1. Supraclypeal area centrally granulosopunctate, punctures shallow and separated by 0.2–0.3× their diameter; supraclypeal width just below antennal sockets: width just above clypeal suture = 1.0: 0.7; eyes strongly convergent ventrally. 2. Supra-antennal area without projections; antenna with 38–42 flagellomeres. 3. Mesosoma elongate (Figs. 6–8), about 1.7× as long as deep. 4. Lateral face of pronotum with posterodorsal area centrally weakly to moderately granulate with small scattered shallow punctures, dorsal and posterior margins crenulate. 5. Mesopleuron centrally granulate, punctures 15–21 µm in diameter and separated by 0.5–1.0× their diameter. 6. Mesoscutum with lateral lobe granulate with shallow punctures separated by 0.3–1.0× their diameter; median lobe defined by shallow notauli extending to slightly beyond mesoscutal midpoint. 7. Ventral division of metapleuron weakly granulate, punctures about 15 µm in diameter and separated by 1.0–2.0× their diameter. 8. Propodeum granulate and impunctate; carinae absent except for PTC and sections of median longitudinal carinae between PTC and propodeal apex; area anterad PTC with numerous strong rugulae, longitudinal near PTC then becoming transverse, extending about 0.8 distance to anterior propodeal margin and laterally extending almost to pleural carina. 9. MS1 slender, usually with weak dorsal convexity on petiole (Fig. 6). 10. Thyridium ovoid, granulate and of lighter color than surrounding tergite, and connected to base of T2 by narrow ridge (Fig. 11). 11. Ovipositor 2.2–2.4× as long as length of hind femur, straight with apical 0.3 slightly decurved. **Color.** Head black to fuscous, with apical 0.5 of mandible dark brown; antenna dark brown to fuscous except for white dorsal surfaces of flagellomeres 1–4 (becoming progressively reduced until flagellomere 4 with only narrow short strip or rarely with strip absent) and white band on flagellomeres 10–17 (comprising 6–8 flagellomeres for any one individual; note band is symmetrical, not extending further on dorsal surface than on ventral). Mesosoma black/fuscous. Fore leg with coxa and trochanter dark brown except for brownish-white ventral trochanteral surface; remainder of leg brown. Middle and hind legs dark brown except for white hind tarsomeres 2–3, and occasional apical 0.2–0.4 of hind tarsomere 1. Wings with membrane with weak brown tint, and veins brown to dark brown. Metasoma dark brown except for narrow whitish-brown apex of T2, and white apical 0.3 of ovipositor sheath. **Measurements.** Body 10.0–14.3 mm (11.0 mm); fore wing 7.0–8.8 mm (7.4 mm).

**Male. Structure.** 1. Supraclypeal area smooth and punctate, punctures deep and separated by 0.2–0.3× their diameter; supraclypeal width just below antennal sockets: width just above clypeal suture = 1.0: 0.7; eyes strongly convergent ventrally. 2. Supra-antennal area without paired median lamellar projections below median ocellus; antenna with 45–47 flagellomeres. 3. Mesosoma elongate, about 1.7× as long as deep. 4. Lateral face of pronotum with posterodorsal area centrally smooth to weakly granulate with small scattered punctures dorsally and posteriorly, dorsal and posterior margins crenulate. 5. Mesopleuron centrally smooth, punctures 15–21 µm in diameter and separated by 1.0–2.0× their diameter (variation: punctures 9–15 µm in diameter and separated by 2.0–3.0× their diameter). 6. Mesoscutum with lateral lobe granulate with shallow punctures separated by 0.3–1.0× their diameter; median lobe defined by shallow notauli extending to slightly beyond mesoscutal midpoint. 7. Ventral division of



**FIGURES 5–6.** *Nonnus* spp., lateral habitus. 5. *N. barnesae* Wahl & Bennett, paratype male (USA: Arizona); AEI photo voucher specimen #1069. 6. *N. spurius* Wahl & Bennett, holotype female; AEI photo voucher specimen #1074.



**FIGURES 7–8.** *Nonnus spurius* Wahl & Bennett, lateral habitus. 7. Paratype male (Mexico: Durango); AEI photo voucher specimen #1073. 8. Paratype male (USA: Arizona); AEI photo voucher specimen #1068.

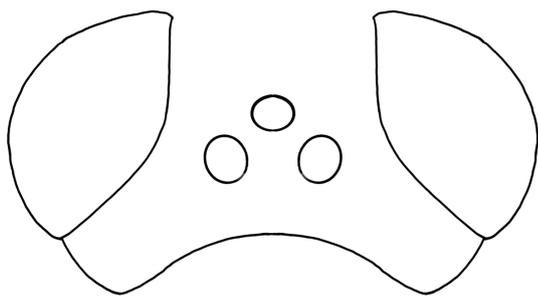


**FIGURES 9–10.** *Nonnus* spp., lateral habitus. 9. *N. antennatus* Cresson, holotype female; ANSP.  
10. *N. atratus* Cresson, holotype female; ANSP.

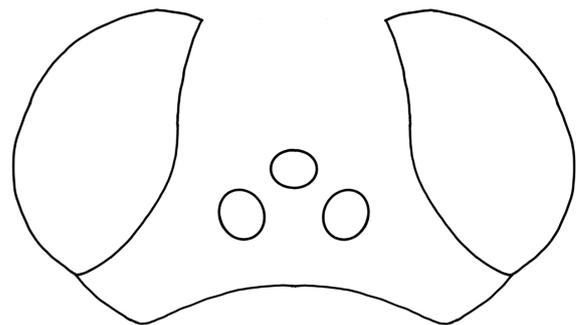


**FIGURES 11–12.** 5. *Nonnus* spp., lateral view of second metasomal tergite. 11. *N. spurius* Wahl & Bennett, holotype female; AEI photo voucher specimen #1074. 12. *N. atratus* Cresson, holotype female; ANSP.

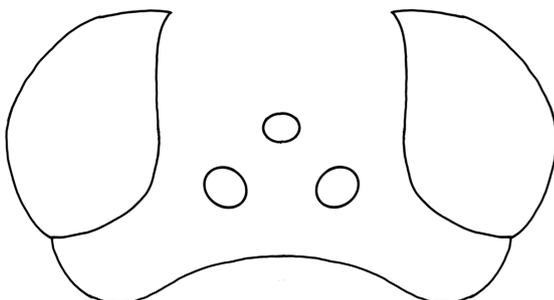
metapleuron smooth, punctures about 15  $\mu\text{m}$  in diameter and separated by 2.0–3.0 $\times$  their diameter (variation: punctures about 9  $\mu\text{m}$  in diameter and separated by 2.0–3.0 $\times$  their diameter). 8. Propodeum smooth to weakly granulate, lateral margins usually with weak punctures separated by 0.3–0.5 $\times$  their diameter; carinae absent except for PTC and sections of median longitudinal carinae between PTC and propodeal apex; area anterad PTC with numerous strong rugulae, longitudinal near PTC then becoming transverse, extending about 0.8 distance to anterior propodeal margin and laterally not extending almost to pleural carina (variation: rugulae sometimes absent except along midline). 9. MS1 slender, without weak dorsal convexity on petiole. 10. Thyridium present as elongate ovoid, granulate and of lighter color than surrounding tergite; connected to base of T2 by narrow ridge (as in Fig. 11). *Color.* Head black to fuscous, with apical 0.5 of mandible dark brown, clypeus rarely with 0.3 of apical margin dark brown; antenna dark brown to fuscous except for white (completely or partially) flagellomeres 15–20 (comprising 4–6 flagellomeres for any one individual). Mesosoma black/fuscous, occasionally with following brown: anterior margin of pronotum, extreme posteroventral corner of mesopleuron, tegula, extreme posterior margin of mesonotum, raised areas of metanotum, and extreme posterior margin of propodeum. Fore leg with coxa and trochanter dark brown, remainder of leg brown to yellowish-brown. Middle leg: coxa, trochanter, and trochantellus dark brown; femur and tibia dark brown to brown; basal 0.3–0.5 of tarsomere 1 sometimes yellowish-brown to brownish-white, remainder of tarsus dark brown. Hind leg: coxa, trochanter, and trochantellus dark brown; femur and tibia brown, tibia shading to dark brown on apical 0.2; tarsus with tarsomere 1 ranging from completely dark brown to having apical 0.3–0.6 yellowish-white; tarsomeres 2–3 yellowish-white; tarsomere 4 dark brown or yellowish-white; tarsomere 5 dark brown. Wings with membrane with weak brown tint, and veins brown to dark brown. Metasoma with MS1 dark brown; T2 dark brown except rarely with brownish-red apex and posterolateral corners; T3–4 light to deep brownish-red, rarely concolorous with T5–8; remainder of metasoma dark brown (including gonoforceps) except for narrow white posterior margins of T7–8. *Measurements.* Body 12.5–13.5 mm; fore wing 7.8–9.0 mm.



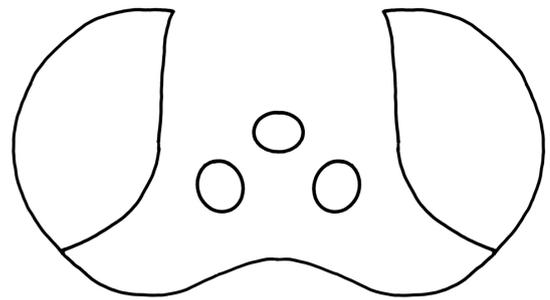
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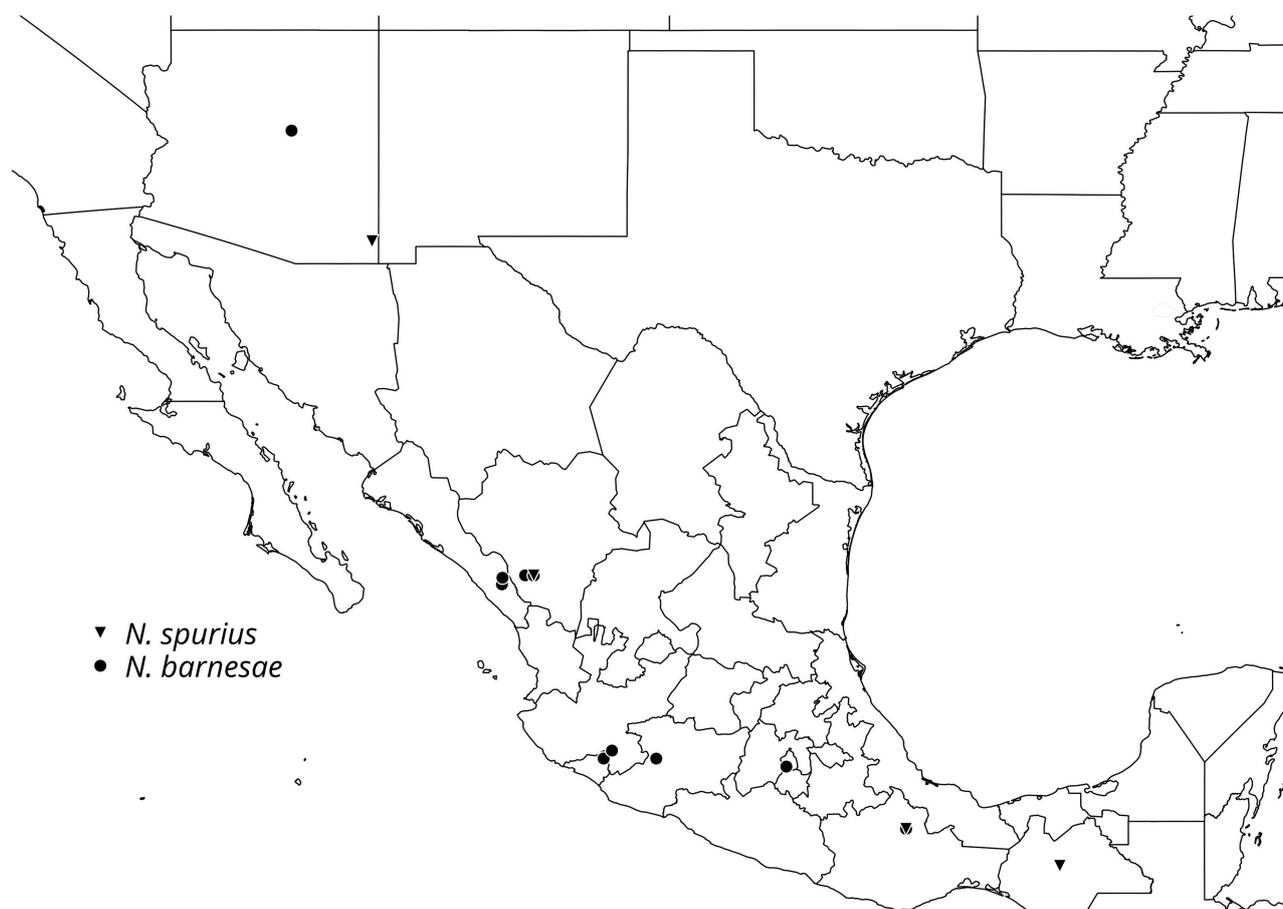
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**FIGURES 13-16.** *Nonnus* spp., dorsal outlines of heads. 13. *N. atratus* Cresson, 14. *N. niger* Brullé. 15. *N. barnesae* Wahl & Bennett. 16. *N. spurius* Wahl & Bennett.

**Material.** Holotype F: **MEXICO**, *Oaxaca*: Vista Hermosa (17° 37' 59.0"N, 96° 20' 31.6"W), 1450 m, 20.x.1962, H. & M. Townes (EMUS). Condition of holotype: intact. Paratypes. **MEXICO**, *Chiapas*: 1F, San Cristobal de las

Casas, 7200 ft., 17.x.1962, B.V. Petersen (EMUS); 1M, *Durango*: 3 mi. east of El Salto, 8500 ft., 4.vii.1964, W.R.M. Mason (CNCI); *Oaxaca*: 1F, Vista Hermosa (17° 37' 59.0"N, 96° 20' 31.6"W), 1450 m, 17.x.1962, H. & M. Townes (EMUS); 2FF2MM, same data as preceding except 19.x.1962 (CNCI, EMUS); 2MM, same data as preceding except 20.x.1962 (EMUS). **USA**, *Arizona*: 1M, Cochise Co., 5 mi. west of Portal, Southwestern Research Station, 5400 ft., 13.ix.1965 (EMUS). Other specimens: **MEXICO**, *Chiapas*: 1M, San Cristobal de las Casas, 7200 ft., 17.x.1962, B.V. Petersen (EMUS).

**Comments.** *Nonnus spurius* is strikingly similar to *Nonnus atratus* Cresson, 1874, which was described from a female specimen collected in Orizaba, Mexico by Adrien Louis Jean de. Sumichrast sometime between 1855 and 1873 (details on Sumichrast from Papavero & Ibáñez-Bernal, 2001). The resemblance is quite close with regard to color and general surface sculpture (Fig. 11 vs. Fig. 12). Several characters, however, lead us to believe it is a separate species: 1) it is 30–40% larger than *N. spurius*, with a body length of 17.3 mm and a wing length of 9.8 mm., 2) the thyridium is linear and relatively smaller than in *spurius*, depressed, has a small posterior pit, and is not connected by a ridge to the anterior margin of T2 (compare Fig. 12 to Fig. 11), 3) the MS1 is arched and more elongate (compare Fig. 10 to Fig. 6), and 4) vein 2/Cu of the hind wing is straight versus slightly apically curved in *N. spurius*.



**FIGURE 17.** Distributions of *Nonnus barnesae* Wahl & Bennett and *N. spurius* Wahl & Bennett.

*Nonnus niger* (Brullé) is another black species, originally described from Brazil, with a putative range from Brazil to Panama (Townes & Townes, 1966). Krieger (1903) discussed the black *Nonnus* specimens in his personal collection. Apparently working solely from published descriptions, he assigned his two male specimens (from Peru and Bolivia) to *Nonnus albitarsis* (Brullé), now a junior synonym of *N. niger* (Townes & Townes, 1966). The six females, which he considered to ‘broadly agree’ with *N. niger* (“mit *Atractodes niger* Brullé in Bezug auf diese Merkmale im Grossen und Ganzen überein”) were from Bolivia, Brazil, Panama, and Peru. Unfortunately, we were not able to borrow the Brullé types from the Museum d’Histoire Naturelle. We did, however, have specimens compared by Henry Townes to the Brullé types. While acknowledging that ‘compared with type’ (CWT) specimens can have considerable drawbacks, the Townes *N. niger* CWT specimen (**Brazil**: *Santa Catarina*, Nova Teutonia) is decidedly

a different species than *N. spurius*: the angulation of the gena in dorsal view is quite different (Fig. 14 vs. Fig. 16); mesopleural sculpture is strongly granulate with punctures about 10 µm in diameter and separated by 0.5–1.0× their diameter; propodeal rugosity is weak and confined to the central median region; size is noticeably larger (fore wing 13 mm long). It should be noted that *N. atratus* is quite different from *N. niger* as well: the angulation of the gena in dorsal view is subtly different (Fig. 13 vs. Fig. 14); the mesopleural punctation of *N. atratus* is weakly granulate with punctures about 20 µm in diameter and separated by about their diameter; the propodeal rugosity in *N. atratus* is extensive and extends from the PTC to the propodeal anterior margin, and nearly to the lateral margins; the thyridium is not depressed, lacks a posterior pit, and is connected by a ridge to the anterior margin of T2.

A female collected 3 miles [4.8 km] east of El Salto is readily assignable to *N. spurius*. The associated male has the metasoma completely dark brown. While this is probably natural variation, we prefer to exclude this male from the paratypes.

The range of *N. spurius* is mostly concurrent with *N. barnesae*: ranging from the Isthmus of Tehuantepec north through the Sierra Madre Orientale to Arizona (Fig. 17).

See the “Comments” section for the *N. barnesae* species description regarding the location of Vista Hermosa.

**Etymology.** The specific name derives from the Latin *spurius*, false or bastard, referring to the deceitful resemblance to *N. atratus*.

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