REVISION OF THE NEW WORLD SPECIES OF THE THYANTAE GROUP OF TRISSOLCUS (HYMENOPTERA: SCELIONIDAE)

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Abstract

The thyantae group of Trissolcus is characterized by the presence of abundant long setae on the metapleuron. All known New World species occur in the Nearctic, viz. T. thyantae Ashmead (eastern USA and Canada), T. occiduus n. sp. (western USA), T. parma n. sp. (widespread), and T. ruidus n. sp. (Arizona, New Mexico). An identification key is provided and all species are described or redescribed. Data on distributions and hosts (Heteroptera: Pentatomidae) are summarized.

Résumé

Le groupe thyantae du genre Trissolcus est caractérisé par la présence de longues soies sur le metapleure. Toutes les espèces connues du Nouveau Monde se retrouvent dans la région nkarctique, soient T. thyantae Ashmead (est des USA et Canada), T. occiduus n. sp. (ouest des USA), T. parma n. sp. (largement répandue) et T. ruidus n. sp. (Arizona, Nouveau-Mexique). On fournit une clé d’identification et toutes les espèces sont décrites ou redécrites. Les données sur leur répartition et leurs hôtes (Heteroptera: Pentatomidae) sont résumées.

Most species of the subfamily Telenominae (Hymenoptera: Scelionidae) have at most a few setae along the ventral margin of the metapleuron. One portion of the genus Trissolcus is unusual in that the metapleural surface is clothed with long setae (Figs. 1, 4). This group of species is referred to here as the thyantae group.

Safavi (1968) used the setose metapleuron in his key to the species of Trissolcus of the Middle East, North Africa, and southern Europe (under the generic name Asolcus Nakagawa, a name synonymized with Trissolcus by Masner 1964). He included the following species within this group: T. eurydemae (Vasiliev), T. festivae (Viktorov), T. ghorfii (Delucchi and Voegelé), T. histani (Voegelé), T. reticulatus (Delucchi), T. scutellaris (Thomson), T. simoni (Mayr), T. vassiliiewi (Mayr), and T. volgensis (Viktorov). The metapleural character, however, was not used in the taxonomic works on Palearctic Trissolcus of Nixon (1939) and Kozlov and Lé (1977), nor by Nixon (1935, 1938, 1943) on Ethiopian and Oriental Trissolcus.

The Nearctic species of the thyantae group are further characterized as follows (terms defined in Masner 1979, 1980): radicle concolorous or lighter than scape, never darker; hyperoccipital carina absent; orbital furrow poorly developed; claval formula (Bin 1981): A11-A7/1-2-2-2-2 (i.e. 1 plate sensillum on A11, 2 on A10, etc.); notauli fine, but distinct (Fig. 1, n); episternal foveae (extending from acetabular carina toward mesopleural pit) distinct (Fig. 2, ef); metapleuron setose; T1 without sublateral setae.

Species of the thyantae group seem to be uncommon. I have seen specimens from the Nearctic, Palearctic, Ethiopian, and Australian realms. Some of the African specimens are unusual in that they have fan-like striae on the frons originating near the bases of the mandibles. This character appears rather commonly in the subfamilies Scelioninae and Teleasinae, but within the Telenominae is unusual (found primarily in the genera Psix Kozlov and Lé and Archiphanurus Szabó). If this is a plesiomorphic character, it implies either that the thyantae group is an early separation from the line leading to the rest of Trissolcus, or that the thyantae group is paraphyletic.

In this paper I discuss the four species of the thyantae group found in the New World, all in the Nearctic region. I have not seen any specimens of this group from the Neotropics; however, the fauna of that region has not yet been sufficiently sampled to be able to state with confidence that the thyantae group is absent there.
This revision is based upon specimens from the following institutions: California State Department of Food and Agriculture, Sacramento, CA (CDFA); Canadian National Collection of Insects, Arachnids and Nematodes, Ottawa, ON (CNC); Los Angeles County Museum, Los Angeles, CA (LACM); New York State Museum, Albany, NY; United States National Museum of Natural History, Washington, DC (USNM).

Trissolcus thyantae

Figs. 1, 2

Trissolcus thyantae Ashmead, 1893: 163, female. Type-locality: Selma, Alabama.

Host: Thyanta custator (Heteroptera: Pentatomidae). Lectotype (examined) in USNM.

Trissolcus thyantae: Kieffer, 1926: 128.

Trissolcus thyantae: Masner and Muesebeck, 1968: 74 (lectotype designation).

Length 0.94–1.16 mm ($N = 20$). Hyperoccipital carina absent; frons, vertex, occiput covered with shallowly impressed coriaceous microsculpture; frons laterally with setae inserted into large, poorly delimited punctures; preocellar pit present; antennal scrobes with short, poorly defined central keel, transverse wrinkles not extending beyond scrobes; inner orbits margined above by fine raised line, line obsolete ventrally, orbital furrow thus defined narrow, absent ventrally; mandibles tridentate, teeth shallowly incised, acute; mandibular insertions margined above by sharply defined, narrow, smooth triangular area, above this with setae inserted into large, poorly delimited pleurostomal puncture; malar region and gena with same sculpture as occiput; malar region not strongly bulging below eyes; genal carina absent.

Mesoscutum covered by coriaceous microsculpture, with only weak indications of longitudinal elements in sculpture posteriorly; notauli narrow, distinct; scutellum smooth, without microsculpture (Fig. 1); dorsellum with dorsal transverse row of deep pits along scutellar-metanotal suture, longitudinally carinate ventrally; netrion well developed; epomial carina absent; episternal foveae well developed, line of 4–5 deep, dorsoventrally elongate pits extending from dorsal apex of acetabular carina toward mesopleural pit (Fig. 2, ef); mesopleural carina absent ventrally; mesepisternum anterior to mesopleural carina coriaceous; course of metapleural carina not indicated by distinct line of pits, dorsal portion of metapleuron-propodeum below spiracle marked by irregular longitudinal carinae; ventral portion of metapleuron setose; anterior expansion of metapleuron toward mid-coxa short, acute apically.

T1 with no sublateral setae; T2 with weak wrinkles extending well beyond basal costae, apex smooth; T2 with short, irregular subapical line of setae, few setae along T2-laterotergite line of flexion; T3 and beyond punctulate, with single subapical transverse line of setae.

Wings extending beyond apex of metasoma; radicle yellow to brown, lighter in color than scape; antennae otherwise dark brown to black; femora and tibiae infuscate at least medially.

Hosts: Thyanta custator, Euschistus sp., Nezara viridula (Heteroptera: Pentatomidae).

Material examined. 73 ♀♀ 9♂♂ from: USA: Alabama (Dallas Co., lectotype), Georgia (Thomas Co.), Illinois (McHenry Co.), Maryland (Washington Co.), Massachusetts, Mississippi (Oktibbeha, Washington Cos.), Missouri (Boone Co.), New York (Albany, Dutchess Cos.), Ohio (Sandusky, Wayne Cos.), South Carolina (Barnwell, Oconee Cos.). CANADA: Nova Scotia, Ontario.

Remarks. Trissolcus thyantae is most similar to the species described next, T. occiduus, from which it may be distinguished by its narrow malar region, by the lack of a mesopleural carina, and by the dark legs and antennae. Trissolcus thyantae may be separated from the
other two Nearctic species of the thyantae group described below (*ruidus* and *parma*) by its smooth scutellum and lack of a mesopleural carina.

*Trissolcus thyantae* appears to be an eastern Nearctic species; the westernmost records are from Columbia, Missouri, and Sault Ste. Marie, Ontario. This distribution does not overlap that known for *T. occiduus*. Whether these two species are truly allopatric is uncertain; it may be a reflection of collecting effort in the central states and provinces of the USA and Canada.

**Trissolcus occiduus new species**

Figs. 3, 4

Length 0.84–1.36 mm (*N* = 20). Very similar to *T. thyantae*, differing in the following characters: head, viewed laterally, with malar region strongly expanded posteriorly (Fig. 3); malar region with variably developed, irregular rugulae superimposed on micro-sculpture; mesopleural carina usually indicated ventrally by fine raised line; usually at least tibiae and scape yellow, appendages generally much lighter in color.
Hosts: *Chlorochroa sayi*, *Chlorochroa* sp. (Heteroptera: Pentatomidae).

**Material examined.** Holotype female: USA: California: Ventura Co., Pt. Mugu Naval Air Sta., Area 2, 24–31.viii.1981, C.D. Nagano and J.N. Hogue (CNC). Paratypes: USA: 8♀ 4♂ with same locality data as holotype, collected 31.vii-24.viii (6♀ 1♂), 31.viii-20.ix (1♀ 1♂), 6-13.ix (1♀ 1♂), 20-26.ix (1♂) (CNC, N. F. Johnson). California: Riverside Co., Menifee valley, hills on W end, 33°35'N 117°31'W, 1800' el.[549m], 13-27.v.1981, J.D. Pinto, 1♀ (CNC); San Diego Co., Imperial Bch., 29.viii.1977, ex *Chlorochroa* n. sp. eggs on *Abronia maritima* Nutt [Nyctaginaceae], 77H29-20, 1♂ (USNM); Sta Cruz Mts, 1♀ (USNM). Colorado: Boulder, 11.vi.1961, 5000' [1524 m], W.R.M. Mason, 4♀ (CNC). Idaho: Fremont Co., St. Anthony Dunes, 5400' [1646 m], 9-10.vii.1980, M.S. Wasbauer Collector, Malaise trap 8AM-6PM, 2♀ (CDFA); Owyhee Co., 8 mi [17.7 km] E Silver City, 26.vi.1981, 6000' [1829 m], J.B. Woolley, 1♀♀ (CNC). New Mexico: Maxwell, Webster No. 11150, 4.iii.1915, D.J. Caffrey Collector, reared from “Pentatoma sayii” [Chlorochroa sayi], 3♀ 5♂ (USNM, LACM); Valencia Co., 32 km W of Los Lunas, Carizzo Arroyo, 1-23.viii.1977, S. and J. Peck, 2♀ (CNC). Other material: 1 badly broken female from Boulder, Colorado with same data as paratypes above (CNC). Idaho: Hollister, plot 4, inside, 4.v.1931, D.E. Fox (USNM).

**Remarks.** This species may be distinguished from *T. thyantae* by the expanded malar region and the presence of a raised mesopleural carina; and from *T. parma* and *T. ruidus* by its smooth scutellum, expanded malar region, and lack of any indication of a longitudinal carina on the gena.

I have seen specimens of this species from the western United States only. The name *occiduus*, from the Latin for western, refers to this distribution. Some specimens from New Mexico have dark appendages and are rather small. Probably as a consequence of size, these are unusual in that the mesopleural carina is absent. More collections are needed to address the question of whether *T. occiduus* is a species distinct from *T. thyantae* or whether the variation observed in specimens such as those from New Mexico indicates that there is a transition from typical *thyantae* to *occiduus* phenotypes in the central states.

**Trissolcus puma new species**

Length 0.84–1.09 mm (N = 7). Similar to *T. thyantae*, differing as follows: frontal sculpture variably developed, some with microsculpture deeply impressed, setigerous punctures well defined; other specimens with microsculpture very shallowly impressed, large punctures absent; smooth area above mandibular insertions broad, triangular; longitudinal carina on gena indicated by irregular ridge extending from mandibular insertions dorsad; scutellum covered with shallowly impressed coriaceous microsculpture; mesopleural carina indicated ventrally by fine raised line; legs, except coxae, yellow, femora sometimes brownish yellow medially.

**Host unknown**

**Material examined.** Holotype female: CANADA: Alberta: Scandia, 2.vii.1956, O. Peck; swept from alfalfa [Medicago sativa, Leguminosae] (CNC). Paratypes: CANADA: 1♀ with same data as holotype (CNC). British Columbia: Victoria, 4-16.vi.1981, A.T. Finamore, 1♀ (CNC). Manitoba: Fort Churchill, 8.ix.1953, C.A. Barlow; open tundra under Vaccinium uliginosum [Ericaceae], 1♀ (CNC). Northwest Territories: Reindeer Depot, Mackenzie River Delta. 15.vi.1948, W.J. Brown, 1♀ (CNC). USA: Illinois: Algonquin [McHenry Co.], 15.viii.1895, 114; 4906, Telenomus, 1♀ (USNM). Texas: Big Bend National Park, 19.vii.1977, lowland desert springs, L. Masner, 1♀ (CNC).

**Remarks.** *Trissolcus parma* may be distinguished from *T. ruidus* by the lack of rugulae on the frons (outside of the antennal scrobes) and the lack of longitudinal elements in the sculpture of the posterior portion of the mesoscutum. It may be separated from the two
other known Nearctic species of the thyantae group by means of the coriaceous micro-
sculpture present on the scutellum.

The name, *parma*, from the Latin word for a small shield, refers to the scutellum
with its characteristic microsculpture.

*Trissolcus parma* is known from only a few specimens distributed over a broad range,
from the Arctic Ocean to the Mexican border of the USA. There is much variability among
these specimens: the two from northern Canada are quite small; the specimen from the
Northwest Territories has wings that are strongly narrowed and relatively short (just sur-
passing the apex of the metasoma); the frontal sculpture may show large, well-defined
setigerous punctures, or punctures may be lacking altogether. I present here the hypothesis
that these specimens belong to a single, widespread, and variable species. Obviously many
more collections are needed to resolve this problem.

*Trissolcus ruidus* new species

Length 1.16–1.29 mm (*N* = 4). Differs from the preceding species, *T. parma*, only
in the following: irregular rugae superimposed on frontal microsculpture; transverse scro-
bal sculpture more extensive, extending dorsad of central keel; mesoscutum between
notauli with distinct longitudinal elements in sculpture.

Host unknown.

**Material examined.** Holotype female: USA: Arizona: Portal [Cochise Co.], Southwest
Research Station, 19.x.1978, Masner and Gibson (CNC). Paratypes: USA: 1 ♀ with same
data as holotype. Arizona: Portal, Southwest Research Station, 20.viii.1978, Masner,
Yoshimoto, Gibson, 1 ♀ (CNC). New Mexico: Socorro Co., 20 mi [32.2 km] SW Socorro,
Water Cyn., 7000' [2134 m], 28.vi-7.vii. 1979, S. and J. Peck, Malaise, riparian forest,
1 ♀ (CNC).

**Remarks.** *Trissolcus ruidus* may be separated from the very similar species *T. parma*
by its distinct rugulae on the frons and the development of longitudinal striae between the
notauli. Both of these species are distinguished from *T. thyantae* and *T. occiduus* by their
coriaceous scutellum.

The name *ruidus*, from the Latin for rough, refers to the nature of the frontal sculpture.

*Trissolcus ruidus* is known only from the southwestern United States. In view of the
hypothesized wide range of variability of *T. parma* it is legitimate to ask whether *ruidus*
is a distinct species, or yet another variant. Within *Trissolcus* the degree of development
of surface sculpture is often correlated with the size of individuals (Masner 1959). How-
ever, even the largest specimens of *T. parma* do not have irregular rugulae on the frons;
the effect of size on frontal sculpture is reflected rather in the definition of setigerous
punctures and in the depth of incision of the microsculpture.

**Key to the New World Species of the thyantae group of Trissolcus**

1. Scutellum with no surface microsculpture (Fig. 1); mesopleural carina present or absent .... 2
   - Scutellum covered by shallowly impressed coriaceous microsculpture; mesopleural carina present
     ........................................................................................................................................ 3

2. Head, viewed laterally, thick, malar region wide (Fig. 3); mesopleural carina usually present;
   legs, apex of scape usually yellow (western USA to New Mexico, Colorado) ............ *occiduus*
   - Head, viewed laterally, with narrow malar region; mesopleural carina absent ventrally; append-
     ages infuscate (eastern USA and Canada) ................................................................. *thyantae*

3. Frons outside of antennal scrobes with raised, irregular rugulae; mesoscutum between notauli
   with longitudinal rugulae (Arizona, New Mexico) ................................................. *ruidus*
   - Frons coriaceous, with more or less well-defined setigerous punctures, never with raised rugulae;
     mesoscutum with no longitudinal elements in sculpture (widespread) .................. *parma*
A common theme mentioned in this discussion of all species of the thyanta group is the need for more collecting. It may be difficult to obtain long series of the rarer species until the hosts are discovered.

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