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New thagriine leafhoppers from the Oriental Region, with a key to 30 species (Homoptera: Cicadellidae: Coelidiinae)

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NEW THAGRIINE LEAFHOPPERS FROM THE ORIENTAL REGION, WITH A KEY TO 30 SPECIES (HOMOPTERA: CICADELLIDAE: COELIDIINAE)

M. W. Nielson

ABSTRACT.—Five new species of *Thagria* from the Oriental region are described and illustrated. These include *nelichari* from Thailand, *unidentata* from Indonesia, *marissae* from southern China, *bifida* from Nepal, and *insolentis* from an undetermined locality in the Oriental region. There are presently 166 species in this large and unique genus. A key to males of 30 species is included.

The genus *Thagria* Melichar is the largest group of coelidiine leafhoppers. Although they occur primarily in the Oriental region, many species are found in the Australian region (not known in Australia proper) and several are in the southern Palearctic region (southern China, southern Korea, and southern Japan). Prior to 1977 only 36 species were known. Since then 125 species have been described (Kwon and Lee 1979, Nielson 1977, 1980a, 1980b, 1980c, 1980d, 1982). The five new species described herein bring the present total to 166 species.

The genus is uniquely characterized by the males possessing a distinctive and highly diverse ventral paraphysis on which a tubular aeadeagal shaft is attached basally to and freely articulates dorsally with the paraphysis. The many configurations of the ventral paraphysis in combination with highly modified structures of the 10th segment and caudodorsal processes of the pygofer differentiate the numerous species.

A key to males of 30 species including those described in previous papers (except Kwon and Lee 1979) after my 1977 revision and those treated herein is presented. A regional key for all known species will be presented later.

Host plants and biology of species in the group are very poorly known.

Key to Males of *Thagria*

1.	Clypellus broad, swollen basally or nearly so, basal width equal to or greater than basal width of clypeus, lateral margins usually narrowed medially	2
—	Clypellus narrow, never swollen basally, basal width narrower than basal width of clypeus, lateral margins usually parallel, sometimes expanded distally	16
2(1).	Ventral paraphysis curved ventrally at distal 1/2 to 1/3 in lateral view, apex decurved	3
—	Ventral paraphysis not as above, in lateral view straight or recurved	5
3(2).	Style with apex bifurcate or divided into 2 slender rami	4
—	Style not as above (Fig. 16, Nielson 1980a)	*blockeri* Nielson
4(3).	Aedeagus long, extending beyond midlength of ventral paraphysis; 10th segment process with dentate process on middle of dorsal margin (Fig. 2)	*bifida*, n. sp.
—	Aedeagus shorter, reaching to about midlength of ventral paraphysis; 10th segment process with longer process on ventral margin (Fig. 25, Nielson 1980b)	*thailandensis* Nielson
5(3).	Ventral paraphysis symmetrical	6
—	Ventral paraphysis asymmetrical	10
6(5).	Tenth segment with paired processes	7
—	Tenth segment without paired processes (Fig. 13, Nielson 1980b)	*ampla* Nielson
7(6).	Ventral paraphysis without basal paired processes on dorsal margin	8
—	Ventral paraphysis with basal paired processes on dorsal margin (Fig. 22, Nielson 1980b)	*serrastyla* Nielson
8(7).	Style very long, exceeding midlength of ventral paraphysis; ventral paraphysis without spines distally	9
—	Style very short, not reaching midlength of ventral paraphysis; ventral paraphysis with lateral spines distally (Fig. 28, Nielson 1982)	*barbata* Nielson
9(8).	Style attenuated distally (Fig. 2, Nielson 1982)	*fossiata* Nielson

[1]Monte L. Bean Life Science Museum, Brigham Young University, Provo, Utah 84602.

— Style forked distally (Fig. 11, Nielson 1980c) ..... *furculata* Nielson

10(5). Ventral paraphysis with basal processes on dorsal margin 11

— Ventral paraphysis without basal processes but with medial or subapical processes on dorsal margin 14

11(10). Ventral paraphysis with paired basal processes 12

— Ventral paraphysis with single basal process. 13

12(11). Basal processes on paraphysis symmetrical (Figs. 11,12) ..... *melichari*, n. sp.

— Basal processes on paraphysis asymmetrical (Fig. 40, Nielson 1982) ..... *hollowayi* Nielson

13(11). Style broad throughout in dorsal view, without dentate subapical processes (Fig. 39, Nielson 1980b) ..... *boulardi* Nielson

— Style narrowed at distal 1/4 in lateral view, with dentate subapical process (Fig. 35, Nielson 1980b). ..... *paraornata* Nielson

14(10). Tenth segment and caudodorsal margin of pygofer with processes of equal length in lateral view; ventral paraphysis with short lateral process distad of middle. 15

— Tenth segment and caudodorsal margin of pygofer with processes of unequal length in lateral view; ventral paraphysis with short lateral process on middle (Fig. 4, Nielson 1980b). ..... *undulata* Nielson

15(14). Tenth segment processes very narrow and sinuate, nearly needlelike at distal 2/3 in dorsal view (Fig. 8, Nielson 1980b) . *capilla* Nielson

— Tenth segment processes broader and nearly straight, not needlelike in dorsal view (Fig. 20, Nielson 1980a) ..... *paradigitata* Nielson

16(2). Ventral paraphysis symmetrical 17

— Ventral paraphysis asymmetrical 25

17(16). Ventral paraphysis keeled ventrally 18

— Ventral paraphysis not as above 20

18(17). Ventral paraphysis with subbasal ventral keel 19

— Ventral paraphysis with subapical ventral keel (Fig. 10, Nielson 1980d) . *paraloae* Nielson

19(18). Style very long, extending beyond apex of ventral paraphysis (Fig. 22, Nielson 1980d) ..... *samuelsoni* Nielson

— Style very short, extending only to base of ventral paraphysis (Fig. 3, Nielson 1980c) ..... *ventrocarina* Nielson

20(17). Ventral paraphysis with paired basal process on dorsal margin 21

— Ventral paraphysis not as above 22

21(20). Paired basal processes of paraphysis very long, nearly reaching to apex of paraphysis (Fig. 3, Nielson 1980d) ..... *bilateralis* Nielson

— Paired basal processes of paraphysis shorter, not reaching midlength of paraphysis (Figs. 16, 17) ..... *insolentis*, n. sp.

22(20). Caudoventral lobe of pygofer without spines 23

— Caudoventral lobe of pygofer with 2 short spines apically (Fig. 7, Nielson 1982). ..... *bidentata* Nielson

23(22). Ventral paraphysis without lateral processe 24

— Ventral paraphysis with lateral processes subapically (Fig. 3, Nielson 1980a). ..... *srilankensis* Nielson

24(23). Style with subapical bifurcation (Fig. 21, Nielson 1982) ..... *bifurcata* Nielson

— Style without subapical bifurcation (Fig. 11, Nielson 1980a) ..... *brincki* Nielson

25(16). Style with distal half straight or nearly so ... 26

— Style with distal half hooked (Fig. 17, Nielson 1980d) ..... *paraexilis* Nielson

26(25). Ventral paraphysis without ventral keel 27

— Ventral paraphysis with ventral keel subbasally (Fig. 17, Nielson 1982) ..... *mutabilis* Nielson

27(26). Ventral paraphysis with 1–2 lateral processes on or near apex. 28

— Ventral paraphysis without such processes .. 29

28(27). Ventral paraphysis with a pair of unequal distal processes (Fig. 23) ..... *marrisae*, n. sp.

— Ventral paraphysis with a single, large, retrorse lateral process subapically (Fig. 35, Nielson 1982) ..... *retrorsa* Nielson

29(27). Caudoventral lobe of pygofer with a single long spine (Fig. 26) ..... *unidentata*, n. sp.

— Caudoventral lobe of pygofer without such spine (Fig. 13, Nielson 1980c) ..... *kaloostiani* Nielson

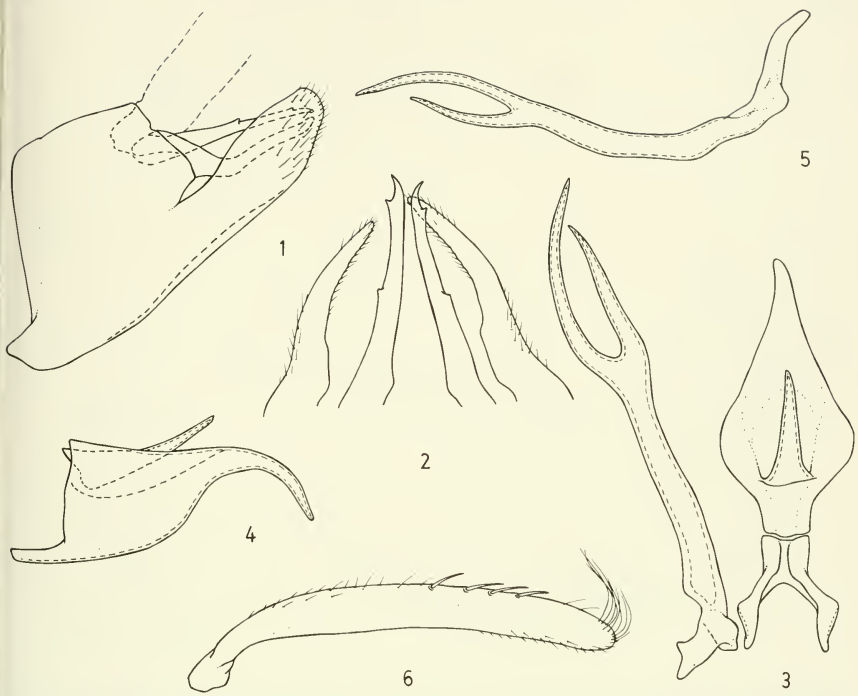
Thagria bifida, n. sp.

Figs. 1–6

LENGTH: Male 6.90 mm.

Moderate-sized, slender species. General color black with tannish translucent costa, face black.

Head small, subconical, much narrower than pronotum; crown broad, width about equal to width of eyes, produced beyond anterior margin of eyes, elevated above level of eyes, lateral margins convergent basally; eyes moderately large, semiglobular; pronotum with length about equal to length of crown; scutellum large; forewings long and narrow, venation typical of genus; clypeus long and broad, lateral margins excised near middle; clypellus short and broad, base broad and swollen, lateral margins below converging to truncate apex.



Figs. 1–6. *Thagria bifida*: 1, Male pygofer and 10th segment, lateral view. 2, Tenth segment, and pygofer processes, dorsal view. 3, Connective, aedeagus, ventral paraphysis and right style, dorsal view. 4, Aedeagus and ventral paraphysis, lateral view. 5, Right style, lateral view. 6, Plate, ventral view.

MALE: Pygofer in lateral view with rather long, broad, caudoventral lobe, apex narrowly rounded; caudodorsal margin with long, narrow, slightly sinuate process, nearly reaching apex of caudoventral lobe (Fig. 1); 10th segment with pair of long slender acuminate processes nearly reaching to apex of anal tube, processes with 2 small dentate projections, one subapical and one near middle on dorsal margin (Figs. 1, 2); aedeagus symmetrical, long, extending beyond midlength of ventral paraphysis (Fig. 3); ventral paraphysis short, very broad at basal half in dorsal and lateral views, narrowed at distal half and decurved in lateral view (Figs. 3, 4); style very long, extending beyond apex of ventral paraphysis, bifurcate subapically, inner bifurcation shorter than outer one (Fig. 3); plate long and narrow with few lateral macrosetae and few short microsetae apically (Fig. 6).

HOLOTYPE (male): NEPAL: Ktmd. [Katmandu], Pulchauki, 8000′, 27.VII. 1967. Can. Nepal Exp. (CNC)

REMARKS: This species is similar to *obrienae* Nielson but can be distinguished by the diagnostic bifurcate style.

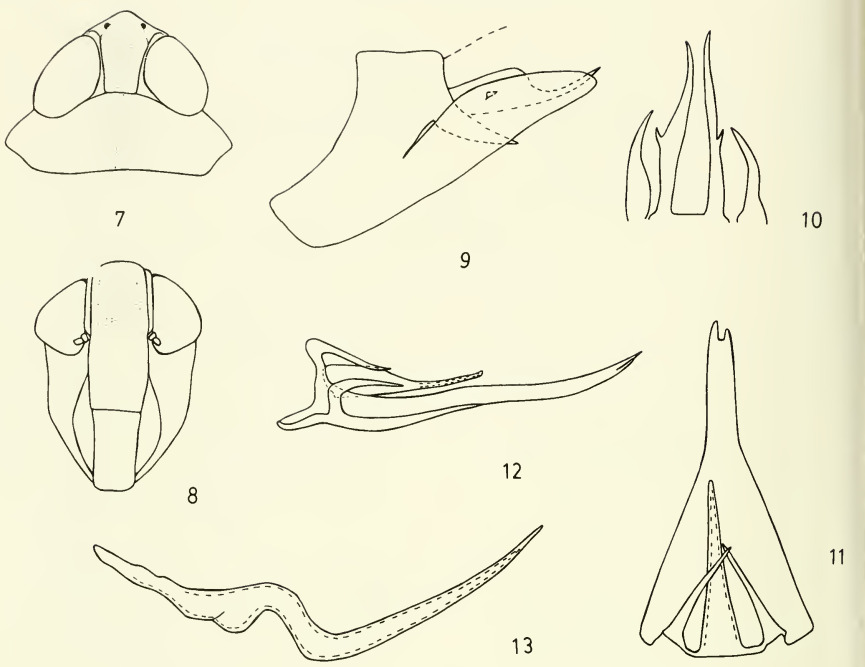
Thagria melichari, n. sp.

Figs. 7–13

LENGTH: Male 6.60 mm.

Moderately robust species. General color ochraceous with narrow transverse ivory markings on forewings, veins embrowned with small irregular ochraceous spots, on veins.

Head much narrower than pronotum (Fig. 7); crown narrow, produced distally beyond anterior margin of eyes, length twice basal width, anterior margin angulate, lateral mar-



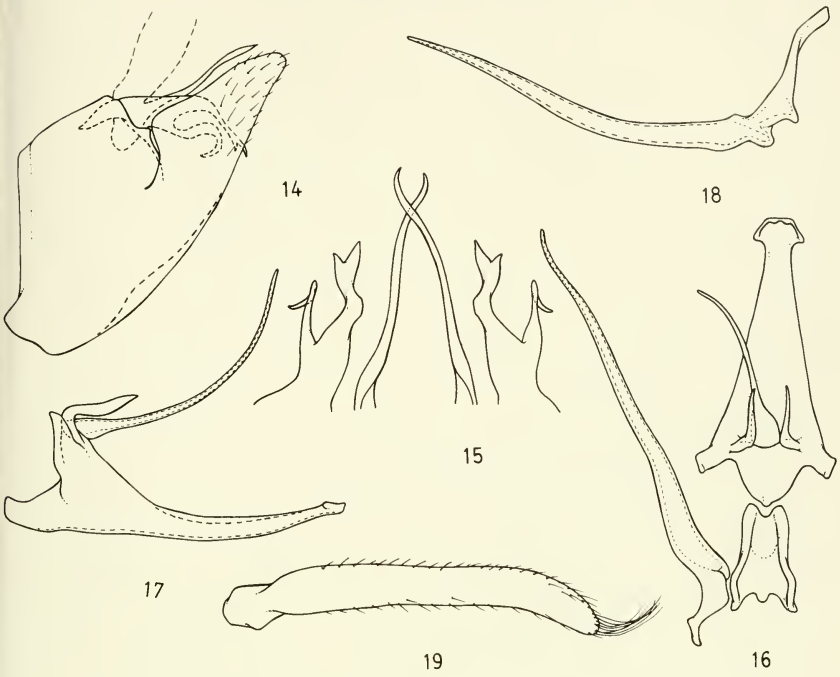
Figs. 7–13. *Thagria melichari*: 7, Head and pronotum, dorsal view. 8, Face, ventral view. 9, Male pygofer and 10th segment, lateral view. 10, Tenth segment and pygofer processes, dorsal view. 11, Aedeagus and ventral paraphysis, dorsal view. 12, Aedeagus and ventral paraphysis, lateral view. 13, Right style, lateral view.

gins convergent basally; eyes large, elongate-ovoid; pronotum large with median longitudinal carina; forewing with venation typical of genus; clypeus long and rather broad; clypellus slightly swollen basally, basal width nearly equal to basal width of clypeus (Fig. 8).

MALE: Pygofer with long, narrow, caudoventral lobe, caudodorsal margin with pair of broad processes (Fig. 9); 10th segment with pair of long ventral processes, processes broad basally, abruptly tapered distally with small projection laterally near middle of process (Figs. 9, 10); aedeagus symmetrical, moderately long, about half as long as ventral paraphysis (Fig. 11); ventral paraphysis slightly asymmetrical, very broad basally in dorsal view, asymmetrically clefted distally, with pair of long basal processes (Figs. 11, 12); style very long, slender, pointed distally and curved laterally in lateral view (Fig. 13); plate long and narrow, typical of genus.

HOLOTYPE (male), THAILAND: Muok-Lek, 1,000 ft, ____. I. ____., H. Fruhstorfer. Additional labels with following information: "H. Fruhstorfer, vend. 25. V. 1924," "*Arya hyalinopunctata* n. sp., manuscript name, L. Melichar det." (MM). Allotype (female), THAILAND: Pakchong, 100 m N of Bangkok, Dec. 2, 1957, J. L. Gressitt (BPBM). Paratypes: VIET NAM: 33 km NE Ban Me Thuot, 500 m, 1 female, 16–18. V. 1960, L. W. Quate (author's collection).

REMARKS: This species is similar in male genitalia characters to *sarawakensis* Nielson but can be separated by the configuration of the 10th segment processes and caudodorsal processes of the pygofer, by the asymmetrically clefted apex of the ventral paraphysis, and by the current geographical range. This species is named for Dr. Leopold Melichar in recognition of his outstanding contributions to leafhopper systematics.



Figs. 14–19. *Thagria insolentis*: 14, Male pygofer and 10th segment, lateral view. 15, Tenth segment and pygofer processes, dorsal view. 16, Connective, aedeagus, ventral paraphysis, and right style, dorsal view. 17, Aedeagus and ventral paraphysis, lateral view. 18, Right style, lateral view. 19, Plate, ventral view.

Thagria insolentis, n. sp.

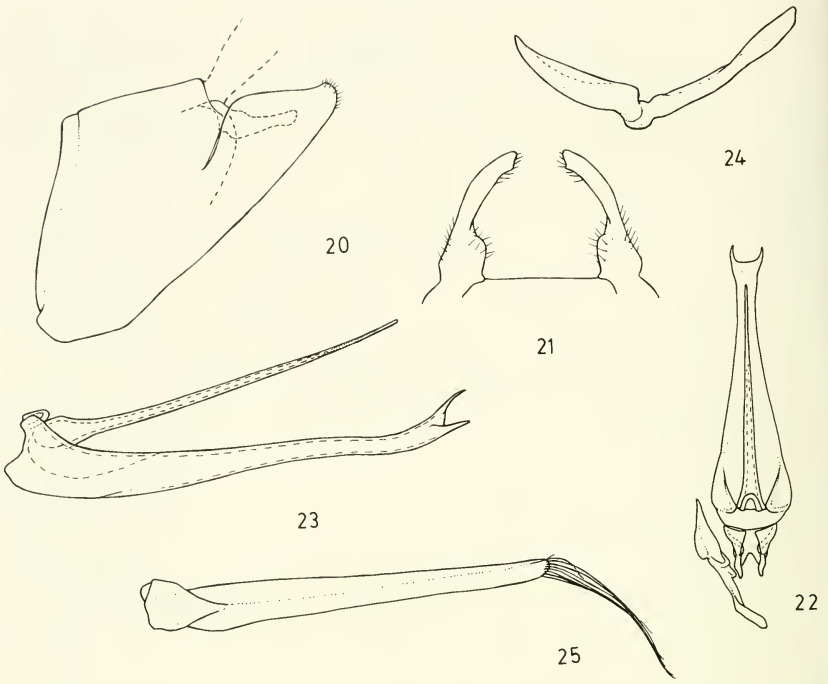
Figs. 14–19

LENGTH: Male 5.90 mm.

Small, slightly robust species. General color light brown with numerous irregular tannish markings on forewings, bullae on dark pronotum ochraceus, crown light tan basally with blackish markings anteriorly, face reddish brown.

Head large, subconical, narrower than pronotum; crown somewhat narrow, width less than transocular width, elevated above level of eyes, produced beyond anterior margin of eyes; eyes large, semiglobular; pronotum short, median length about equal to median length of crown, with short median longitudinal carina originating on anterior margin; scutellum large; forewing moderately long, venation as in description of genus; clypeus long, narrow, excised near antennal sockets; clypellus long and narrow, lateral margins nearly parallel.

MALE: Pygofer in lateral view with elongate triangular caudoventral lobe (Fig. 14); caudodorsal margin with ornate process, process broad basally, abruptly decurved medially with narrow, asymmetrical bifid apex, ventral margin with narrow, hooked secondary process on middle, dorsal margin with short secondary process (Figs. 14, 15); 10th segment with pair of narrow long processes nearly reaching to apex of caudoventral lobe (Fig. 14); aedeagus symmetrical, very long and tubular, curved dorsally at distal half and extending to about apex of ventral paraphysis in lateral view (Figs. 16, 17); ventral paraphysis symmetrical, broad basally with pair of long narrow processes basally on dorsal margin, lateral margins of paraphysis convergent distally to narrow convex apex with short dentate subapical projections laterally (Figs. 16, 17); style very long, attennuated, and sharply pointed api-



Figs. 20–25. *Thagria marissae*: 20, Male pygofer, lateral view. 21, Pygofer processes, dorsal view. 22, Connective, aedeagus, ventral paraphysis, and right style, dorsal view. 23, Aedeagus and ventral paraphysis, lateral view. 24, Right style, lateral view. 25, Plate, ventral view.

cally, exceeding apex of paraphysis (Fig. 16); plate long and narrow, with many long microsetae apically (Fig. 19).

HOLOTYPE (male): [ORIENTAL REGION]: Friese, Teoor (or Tevor), no date, no collector (NM).

REMARKS: The species is near *luteifascia* (Walker). It can be easily distinguished from that species by the ornate caudodorsal processes of the pygofer. The locality of this species is not known but is presumed to be in the Oriental region. In a recent communication from Dr. A. Kaltenbach, Naturhistorishces Museum, Vienna, he stated that the specimen may have come from the Friese collection (H. Freise, 1860–1948) but did not know if Friese collected in the Oriental region.

Thagria marissae, n. sp.

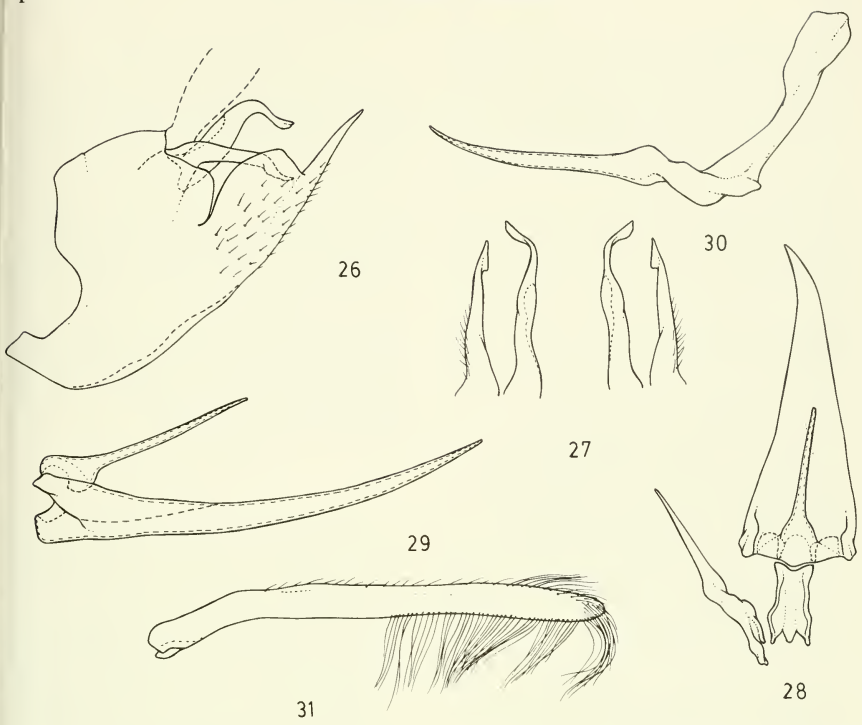
Figs. 20–25

LENGTH: Male 5.75 mm.

Small, slender species. General color light golden brown, suffused with brown markings near apex of forewings and near middle of costa.

Head large, narrower than pronotum, subconical; crown broad, about as wide as eyes, produced distally beyond anterior margin of eyes, lateral margins convergent basally, elevated above level of eyes; eyes large, semiglobular; pronotum and scutellum short, median length of each nearly equal; forewing long and narrow, venation typical of genus; clypeus broad anteriorly, clypellus short, lateral margins nearly parallel.

MALE: Pygofer in lateral view with short broad caudoventral lobe, tapered toward apex, apex rounded, caudodorsal margin with short narrow lobelike process extending distally and not reaching apex of caudoventral lobe (Figs. 20, 21); 10th segment short, simple, without ventral processes (Fig. 20); aedeagus symmetrical, very long and narrow,



Figs. 26–31. *Thagria unidentata*: 26, Male pygofer and 10th segment, lateral view. 27, Tenth segment and pygofer processes, dorsal view. 28, Connective, aedeagus, ventral paraphysis, and right style, dorsal view. 29, Aedeagus and ventral paraphysis, lateral view. 30, Right style, lateral view. 31, Plate, ventral view.

nearly reaching to apex of ventral paraphysis (Figs. 22, 23); ventral paraphysis asymmetrical, broad basally with gradual constriction along middle and slightly expanded distally in dorsal view with pair of short unequal, sharply pointed, lateral processes apically (Figs. 22, 23); style very short, extending just beyond base of aedeagus in dorsal view, narrowly triangular in dorsal view (Fig. 22); plate long and very narrow throughout with tuft of long microsetae apically (Fig. 25).

HOLOTYPE (male): CHINA: Iwa Bi, Hainan Isl., 25. VII. 1935, L. Gressitt (NCSU).

REMARKS: *Thagria marissae* is similar to *T. lurida* (Melichar). It can be separated from *lurida* by the narrower caudoventral lobe of the pygofer, by the longer aedeagus that reaches to the apex of the ventral paraphysis, by the asymmetrical ventral paraphysis, and by its known geographical range. I name this species for my granddaughter, Marissa Jean Hammer.

Thagria unidentata, n. sp.

Figs. 26–31

LENGTH: Male, 7.25–7.75 mm.

Moderately long, slender species. General color tannish brown; eyes tan to brown; crown and pronotum tan, posterior margin of pronotum blackish; scutellum tan to brown; forewing translucent, veins blackish; face tan.

Head much narrower than pronotum, subconical; crown narrower than width of eyes, produced beyond anterior margin of eyes, narrowly rounded distally, lateral margins convergent basally, slightly carinate laterally; pronotum and scutellum equal in length, each

equal in length of crown; forewing long and narrow, venation typical of genus; clypeus long and narrow, lateral margins constricted near antennal sockets; clypellus short, lateral margins wider distally than proximally.

MALE: Pygofer in lateral view with short caudoventral lobe, lobe with long spine on caudoventral margin, spine as long as lobe, caudodorsal margin of pygofer with single long process, process sharply pointed apically, curved posterioventrally, and reaching to apex of caudoventral lobe of pygofer (Fig. 26); 10th segment with pair of long processes, processes decurved ventrally at distal 1/3 (Fig. 27); aedeagus short, tubular, reaching to about midlength of ventral paraphysis (Fig. 28); ventral paraphysis slightly asymmetrical in dorsal view, broad basally with lateral margins gradually convergent distally, distal 1/3 slightly undulated with apex slightly curved laterally (Figs. 28, 29); style short, not reaching midlength of ventral paraphysis, distal half narrowly attenuated (Figs. 28, 30); plate long and narrow throughout, with long microsetae on lateral margins and at apex (Fig. 31).

HOLOTYPE (male): INDONESIA: Siberat Isl., West Sumatra, ____.IX. 1924, B. K. and N. Raffles, Singapore Museum (BMNH). Paratypes. 1 male, same data as holotype (author's collection).

REMARKS: *Thagria unidentata* is similar to *T. fryeri* (Distant) but lacks the distinctive lateral processes on the dorsal margin of the ventral paraphysis and has a much longer spine on the caudoventral margin of the caudoventral lobe of the pygofer.

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