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Systematic relationships of *Vuilletia* and *Senegathrips* (Thysanoptera, Phlaeothripinae) from galls on the West African shrub *Guiera senegalensis*

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Introduction

Widespread and common across much of the drier areas of western Africa, the woody shrub *Guiera senegalensis* (Combretaceae) is the sole member of its genus. Similarly widespread is *Vuilletia houardi*, a thrips species that induces galls on this shrub, and is recorded from Mali, Senegal, Gambia and northern Nigeria (Pitkin & Mound 1973). Moreover, large numbers of galls, together with their included thrips, have now been studied from Burkina Faso. Some galls (Figs 1, 2) are invaded by *Senegathrips coutini*, a species whose biology is not known but that is possibly a predator. Moreover, *Liothrips africana* also sometimes breeds within these galls, but is possibly using these only as a convenient shelter. A re-description and line-drawings of *V. houardi* was provided by zur Strassen (1958), but no modern diagnosis of this genus, nor of *Senegathrips*, is available, the objective here being to provide formal diagnoses for these two monotypic genera.

A more extensive discussion of gall induction by this thrips is in preparation. This is required because a thorough understanding of the relationships between the thrips and the galls is important for public health reasons (Somboro *et al.* 2011). The galls on *G. senegalensis* are marketed in Burkina Faso as a herbal remedy for the treatment of various ailments including malarial fevers (Sombie *et al.* 2012). Validation studies using a laboratory malaria model revealed anti-plasmodial effects of galls and other *G. senegalensis* plant parts (Dahiya *et al.* in prep.).

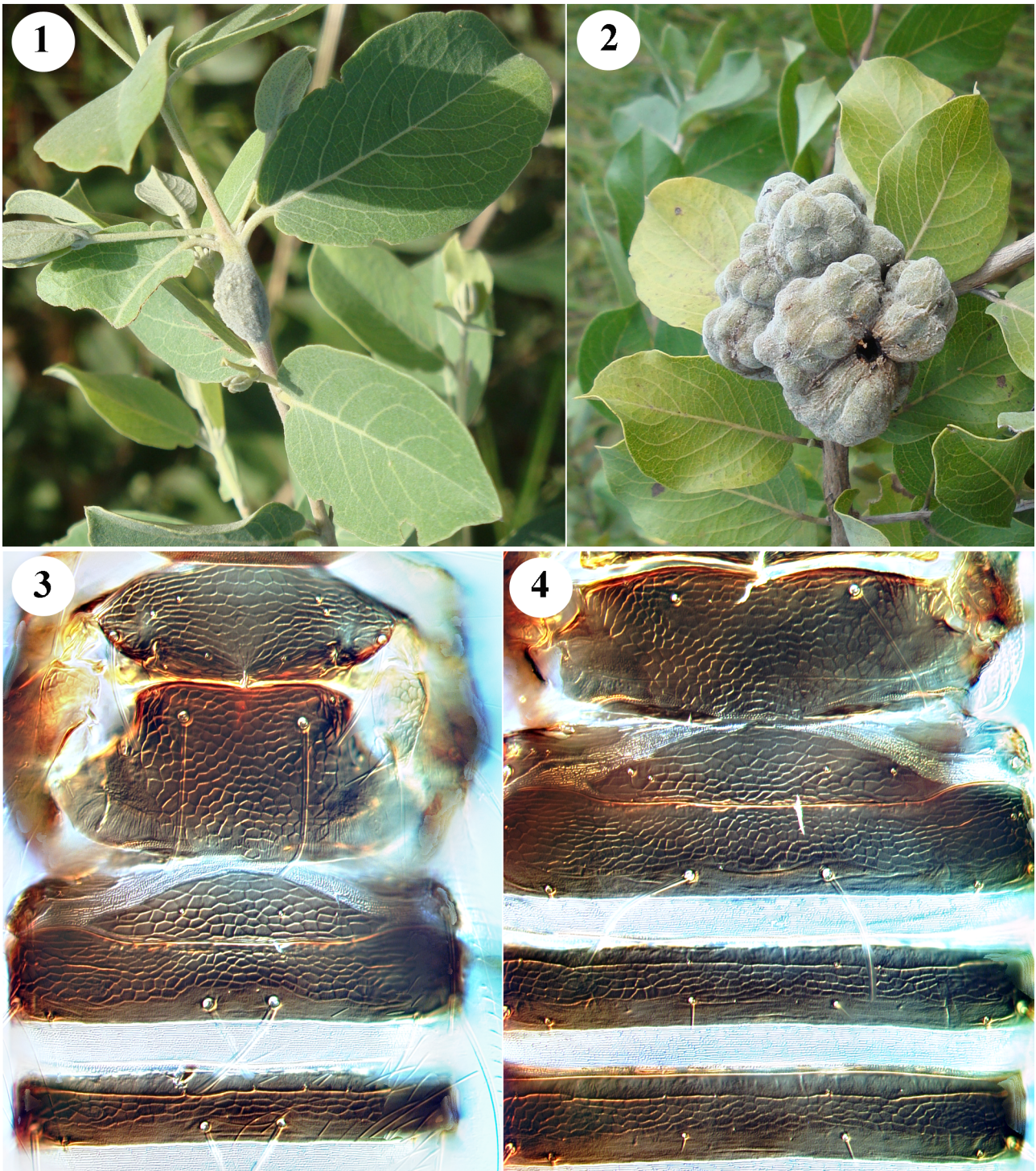
Vuilletia Karny, 1923: 288

Type species *Trichothrips houardi* Vuillet, 1914: 121

Generic diagnosis. Female macropterous or micropterous, male micropterous; antennae 8-segmented, II with sensorium on basal half of segment, III with 1 very small sensorium, IV with 2 sensoria, VIII strongly constricted to base; head small, stylets close together and retracted to eyes, postocular setae long; pronotum broad, notopleural sutures incomplete, all major setae long, weakly capitate, 2 pairs of epimeral setae often developed; prosternal basantra, spinasternum and mesopresternum absent, ferna large and fused medially; metathoracic sternopleural sutures present; mesonotal lateral setae and metanotal median setae long and capitate (Fig 3); fore femora swollen, fore tarsal tooth absent; fore wing parallel sided, no duplicated cilia, sub-basal setae long, capitate; pelta transverse; female tergites II–VII with median setal pair long and capitate, each with one pair of long curved wing-retaining laterally in macroptera (Fig. 3); male tergite II similar, but III–VII with setae wider apart, variable in length (Fig. 4); female tergite IX with 3 pairs of long weakly capitate setae; male tergite IX with S1 and S2 similar to female, but S3 shorter and stouter; tube longer than head; male sternites without pore plates.

Comments. The only species in this genus is similar in its short, stout body form to some gall thrips of Australia that produce dense colonies in long-lived galls on *Casuarina* (Mound *et al.* 1998). However, *Vuilletia houardi* is remarkable because, despite the fore legs and pronotum being greatly enlarged, a fore tarsal tooth is lacking in both sexes. Moreover, the presence of a pair of elongate capitate setae medially on each abdominal tergite of macropterous and micropterous females is unique among Phlaeothripinae, as is the short and stout setal pair S3 on tergite IX of males. Females have a single pair of wing-retaining setae on the tergites, but these setae are long, weakly curved, and arise far more laterally

than is usual amongst Phlaeothripidae. The precise chaetotaxy of the thorax and abdomen is variable in both sexes, and sometimes lacks bilateral symmetry. Despite the presence of only two sensoria on the fourth antennal segment, *Vuilletia* is probably a member of the *Liothrips*-lineage of leaf-feeding Phlaeothripinae (Mound & Marullo 1996; Dang *et al.* 2014).



FIGURES 1–4. *Guiera senegalensis* galls 1–2: (1) Young gall, (2) mature gall. *Vuilletia houardi* chaetotaxy differences 3–4: (3) female macroptera, (4) male microptera.

Type species *Senegathrips coutini* Bournier, 1971: 146

Generic diagnosis. Both sexes macropterous; antennae 8-segmented, II with sensorium on apical half of segment, III with 3 sensoria, IV with 4 sensoria, VIII strongly constricted to base; head longer than wide, cheeks weakly convex; stylets more than one-third of head width apart with distinct maxillary bridge, retracted to postocular setae; postocular setae long; pronotum transverse, notopleural sutures complete, major setae long, weakly capitate, but anteromarginal pair minute, 2 pairs epimeral setae present; prosternal basantra and spinasternum well-developed, ferna large and pointed medially, mesopresternum reduced to two slender triangles; metathoracic sternopleural sutures absent; mesonotal lateral setae long and weakly capitate, metanotal median setae small and acute; fore femora not swollen, fore tarsal inner apex with sharply recurved tooth; fore wing weakly constricted medially, few duplicated cilia, 4 long capitate sub-basal setae; pelta triangular, campaniform sensilla present; tergites II–VII with two pairs of sigmoid wing-retaining setae, median setal pair small; tergite IX with 3 pairs of long pointed setae, S2 of male short and pointed; tube shorter than head; male sternites without pore plates.

Comments. The only species in this genus was described from 12 females taken from *Vuilletia* galls in Senegal. Two males and two females of this species have been studied from Burkina Faso, taken from *Vuilletia* galls. The males are very similar to females, except for the setae on the ninth tergite. The presence of prosternal basantra, a maxillary bridge, fore wings that are weakly constricted medially, and the sensoria of the third and fourth antennal segments, all suggest that this genus is a member of the tribe Haplothripini (Mound & Minaei 2007). Bournier (1971) suggested a relationship to *Mesothrips*, an Asian genus of gall-inducing species. However, the sharply recurved, apical, fore tarsal tooth suggests that *Senegathrips* is more closely related to *Karnyothrips*, and is possibly a predator of the gall-inducing species.

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